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# THE NEOTROPICAL AND MEXICAN ORB WEAVERS OF THE GENERA *CYCLOSA* AND *ALLOCYCLOSA* (ARANEAE: ARANEIDAE)

HERBERT W. LEVI<sup>1</sup>

**ABSTRACT.** Fifty-one neotropical and Mexican species of *Cyclosa* were identified, of which 38 are new. Twelve names have been newly synonymized. The neotropical *Cyclosa* species all have genitalia similar to those of North American *C. caroli*, *C. turbinata* and *C. walckenaeri*. In all females, the epigynum is lightly sclerotized, with openings and sculpturing difficult to see. In most males, the diagnostic palpal features are hidden: the conductor tooth is behind a flap, and the median apophysis is partly hidden below the large conductor of the palpus. A new genus, *Alloccyclosa*, has been established for *C. bifurca*. Synapomorphies place *Cyclosa* close to *Metazygia*, but *Alloccyclosa* is similar to *Cyrtophora* in body shape. It differs from *Cyrtophora* in structure of genitalia and in making a *Cyclosa*-like web.

## INTRODUCTION

This is one of a series of monographs on American orb weavers of the family Araneidae. Previous papers are listed in Levi (1993, 1996, 1997).

The *Cyclosa* species north of Mexico have been described and illustrated in Levi (1977). O. Pickard-Cambridge (1889–1902) and F. P.-Cambridge (1904) named and illustrated the Mexican and Central American *Cyclosa*, although the similarity of their genitalia make them difficult to separate. Of the 23 names for South American *Cyclosa* listed in the five catalogs for spiders (Roewer, 1942; Brignoli, 1983; Platnick, 1989, 1993, 1997), only three are easily recognized: the widespread North American species *C. caroli*; *C. bifurcata* (Walckenaer), separated from *C. walckenaeri* and redescribed and illustrated by Keyserling (1892–93); and *C. tri-*

*quetra*, described by Simon (1895). Numerous new names added in this century did not recognize earlier descriptions. One of the remaining 20 South American names, *C. sericaria* Simon, is a nomen nudum, without description. Seven of the 20 species have been found to belong to other genera. The type of *C. tricolorata* Mello-Leitão is lost, and thus could not be recognized. The 11 species remaining have been identified and are illustrated here for the first time or their names are synonymized. Eight of these 11 were described from Guyana, from which few collections were available. There may be specimens from Guyana in the Natural History Museum, London, but the undetermined collection was not available for loan.

## METHODS AND ACKNOWLEDGMENTS

The methods used are described in Levi (1993). To overcome the difficulties in studying the thin transparent epigyna of *Cyclosa* species, the specimens were examined in alcohol, resting on a background made of short strips of black Vello® glued into a glass dish or in a dish with black silicon carbide crystals as background.

The ventral surfaces of the epigyna face slightly anteriorly and are illustrated from a slightly anterior position. The posterior surfaces face ventrally and are illustrated from a slightly ventral position. To increase visibility of the sculpturing of the epigynum, some specimens were temporarily dried. Ventral surfaces of other females were stained with drops of household dyes, such as tincture of iodine and textile

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dyes. These dyes washed out rapidly, and did not leave the specimen stained. Although drawings were made of the vulva and other internal structures of the epigynum, as in all araneids their internal genitalia are similar and the ducts soft and difficult to see. If more permanent biological stains could be used, then destained, the loops of the internal ducts would be visible from the outside; however this method would damage specimens.

Species matching of males with females is more difficult in *Cyclosa* than in other araneid genera. Not only are the two sexes infrequently collected together, but they look so different that often they are separated into different genera when incoming collections are sorted.

The palpi of a few specimens were expanded in hot 10% sodium hydroxide and then transferred into distilled water. Ultrasonic vibration of the palpus in ethanol removed the embolus from its enclosure in the gutter of the conductor.

Scanning electron micrographs would have been useful for study of the surface of the epigyna and for the small male palpi, but no funds were available for this.

In descriptions, the distances between eyes of the anterior row are expressed as diameters of the anterior median eyes (in profile); distances between eyes of the posterior row are given as diameters of the posterior median eyes (in profile). The height of the clypeus (the distance from the anterior median eyes to the edge of the carapace), is expressed in diameters of the anterior median eye (Levi, 1993, fig. 28f).

Eyes of *Alloycyclosa* and *Cyclosa* were examined by removing the entire eye region from the cephalothorax and placing it in alcohol. Tissues around the eyes were removed with needles. After being removed from alcohol and blotted with tissue, the eye region was immersed in methyl benzoate, which clears the eyes except for the tapetum. In *Alloycyclosa*, black pigment hid cell rows, so the eye region was returned to alcohol, then to water, and

then to a dilute mixture of Clorox® (sodium hypochlorite) for five minutes before being returned to methyl benzoate for re-examination.

Measurements of the ratio of femur and corresponding patella and tibia may have been made from a different specimen than the rest of the description. The design of the microscopic reticule allows for greater accuracy in measurements of small specimens than of large ones. Seven different females of *C. merretes* were measured to assure that their fourth femur is always as long or longer than the corresponding patella and tibia.

Carapace overhang makes the length of the carapace difficult to measure, so size ratio of male to female was obtained by measuring carapace width instead. Abdomen and total length are always smaller in the male than in the female, but the legs of males may be longer. Minute males, as in *Alloycyclosa* and some other araneid genera, lack the endite tooth, coxal hook, and macrosetae of the second tibia. However, these characters should not be used as synapomorphies for genera (Scharff and Coddington, 1997) because they are correlated with body size.

In all geographic data of identified specimens, the names of current political divisions are recorded and measurements are in metric units. Multiple records of very common species are abbreviated to save space.

The following abbreviations are used to identify the source of collections.

ACCH	Academia de Ciencias de Cuba, La Habana, Cuba; L. Armas
AD	A. Dean, Texas A & M University, College Station, Texas, United States
AMNH	American Museum of Natural History, New York, United States; N. Platnick, L. Sorkin
ANSP	Academy of Natural Science, Philadelphia, Pennsylvania, United States; D. Azuma

BMNH	Natural History Museum, London, England; P. Hillyard	MECN	Museo Ecuatoriano de Ciencias Naturales, Quito, Ecuador, Germania Estévez J.
CAS	California Academy of Sciences, San Francisco, California, United States; C. Griswold, W. J. Pulawski, D. Ubick	MHNG	Muséum d'Histoire Naturelle, Genève, Switzerland; V. Mahner
CBF	Coleccion Boliviana de Fauna, La Paz; R. Altamirano	MIUP	Museo de Invertebrados, Universidad de Panamá, Panama City, Panama; D. Quintero A.
CV	Carlos Valderrama A., Bogotá, Colombia	MLP	Museo de Universidad Nacional, La Plata, Argentina; R. F. Arzopide, C. Sutton
DU	D. Ubick, San Francisco, California, United States	MNHN	Muséum National d'Histoire Naturelle, Paris, France; C. Rollard
FDM	F. DelMonte collection, Santo Domingo, Dominican Republic	MNHNC	Museo Nacional de Historia Natural, La Habana, Cuba; G. Alayón G.
FSCA	Florida State Collection of Arthropods, Gainesville, Florida, United States; G. B. Edwards	MNRJ	Museu Nacional, Rio de Janeiro, Brazil; A. Timotheo da Costa; Adriano Brillhante Kury
ICNB	Instituto de Ciencias Naturales, Universidad Nacional de Colombia, Bogotá, Colombia; E. Flórez D.	MUSM	Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Lima, Peru; D. Silva D.
IMPR	Isabella M. P. Rinaldi; Botucatu, Est. São Paulo, Brazil	MZSP	Museu de Zoologia, Universidade de São Paulo, São Paulo, SP, Brazil; P. Vanzolini, J. L. Leme, R. Pinto da Rocha
INPA	Instituto Nacional de Pesquisas da Amazônia, Manaus, Est. Amazonas, Brazil	MZUF	Museo Zoologico de "La Specola" Università di Firenze, Florence, Italy; S. Whitman
IRSNB	Institut Royal des Sciences Naturelles de Belgique, Brussels, Belgium; L. Baert	NRMS	Naturhistoriska Riksmuseet, Stockholm, Sweden; T. Kronstedt
JMM	J. Maes, León, Nicaragua	PAN	Polska Akademia Nauk, Warszawa, Poland; J. Prószyński, A. Słowjewska, W. B. Jedryczkowski, T. Huflejt
MACN	Museo Argentino de Ciencias Naturales, Buenos Aires, Argentina; E. A. Maury, C. L. Scioscia, M. E. Galiano	REL	R. E. Leech, Edmonton, Alberta, Canada
MBCV	Museo de Biología, Universidad Central de Venezuela, Caracas, Venezuela; R. Pérez, R. Candia	SMF	Forschungsinstitut Senckenberg, Frankfurt am Main, Germany; M. Grasshoff
MCN	Museu de Ciências Naturais, Fundação Zoobotânica do Rio Grande do Sul, Porto Alegre, Rio Grande do Sul, Brazil; E. H. Buckup, M. A. L. Marques	SMNK	Staatliches Museum für Naturkunde, Karlsruhe, Germany; H. Höfer
MCP	Museu de Ciências, Pontificia Universidade Católica do Rio Grande do Sul, Porto Alegre, RS, Brazil; A. A. Lise	USNM	National Museum of Natural History, Smithsonian Institution, Washington, D.C., United States
MCZ	Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, United States		

States; J. Coddington, S. F. Larcher

I thank the curators of the collections for the time-consuming loans of both holotypes and for all the undetermined *Cyclosa* specimens. Without their cooperation this revision would not have been possible. C. Valderrama and P. Vanzolini provided geographic information. W. E. Eberhard and Y. Lubin commented on behavior information. Lorna Levi revised the writing; Cay Craig, Laura Leibensperger and Bill Piel read and made many excellent suggestions for improving the manuscript.

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*Relationships.* *Cyclosa*, and probably also *Allocyclosa*, may be closest to *Metazygia* and *Eustala*. Synapomorphies with *Metazygia* include the close spacing of the posterior median eyes (Figs. 23, 24), a carapace with few, scattered, fine setae, and having a scape or lobe attached at some length to the base of the epigynum (Levi 1995a, figs. 11, 18; Fig. 33). Close posterior median eye spacing is found in a few other genera such as *Larinia* (Harrod et al., 1991). *Larinia* is close to *Araneus* and not to *Metazygia* because of palpal structures (see below). *Cyclosa vieirae*, a newly described *Cyclosa* with a globular abdomen (Figs. 284–288), although similar to *Metazygia* in appearance, has a *Cyclosa*-like epigynum and palpus (Figs. 290–293).

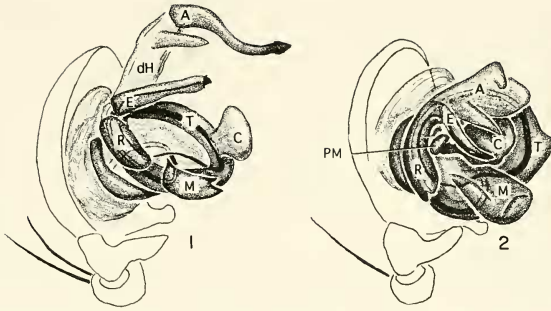
*Cyclosa* and *Metazygia* are separated by Scharff and Coddington's (1997) recent cladograms for araneid genera. The cladograms do not provide a convincing phylogeny. [Scharff and Coddington's placement of *Zygiella* as an araneid is correct. See also Piel and Nutt (1997).]

Scharff and Coddington correctly rejected characters that evolved independently in various genera of araneids as well as throughout the Araneae (e.g., stabili-

menta of webs). But similar, equally unacceptable characters are used; for instance, the presence or absence of a scape on the epigynum. The scape has evolved independently in *Argiope aurantia* (Levi, 1968), *Zygiella kochi* (Levi, 1974), *Eriophora edax* (Levi, 1970), *Wixia abdominalis*, *Ocrepeira gallianoae* (Levi, 1993) and *Micrepeira hocferi* (Levi, 1995b). "Scape annulate/or smooth" (Scharff and Coddington, 1997:377, character 31) is another poor character because of homoplasies. *Cyclosa* is listed as having a wrinkled scape, but only *C. conica* has the scape wrinkled (Figs. 42, 44). All other American *Cyclosa* have a smooth scape. Size dimorphism of males and females has evolved numerous times in families of spiders as well as in genera of the Araneidae (e.g., *Argiope*, *Kapogea*, *Manogea* (Levi, 1997), *Allocyclosa*). In *Mecynogea* the males are larger than females; in the related *Kapogea* they are dwarfed. Also size-related are the hook on the first male coxa and a corresponding groove on the second femur, permitting locking of legs when mating. Found in similar-sized partners or when the male is slightly smaller than the female, they are lacking in most species with dwarf males. Unfortunately size ratios and their dependent size-related characters were used by Scharff and Coddington (1997) as characters 1, 2, 32, 33, 34, 45 and 61. They are not synapomorphies for genera.

The stipes is another character used by Scharff and Coddington for phylogeny. But stipes is just the name for the base of the embolus if it is a free sclerite, and it appears in many palpi that have the palpal articles much dissected (e.g., *Argiope*, *Eriophora*). It is a poor phylogenetic character.

On the other hand, an excellent synapomorphy for genera, the paramedian apophysis (PM in Figs. 2, 39), not found in any other family, but found in Araneidae that share other synapomorphies, is alleged by Scharff and Coddington to have



Figures 1, 2. Araneid left palpi, diagrammatic. 1, *Araneus*. 2, *Alpaida*.

Abbreviations. A, terminal apophysis; C, conductor; dH, distal hematodocha; E, embolus; M, median apophysis; PM, paramedian apophysis; R, radix; T, tegulum.

evolved several times. Scharff and Coddington (1997) believe the "conductor lobe", which is apparently homologous to the paramedian apophysis, to have evolved three times. They reject homology of the paramedian apophysis and the conductor lobe because these characters appear in distal lineages in their cladogram (p. 419). But this is the logical result of considering them as separate characters to make the cladogram (p. 373). It is not surprising that an earlier draft of their manuscript had 60,000 possible parsimonious cladograms [as stated by Scharff and Coddington (1997: 403)]. The many homoplasies and later losses of characters used in their present cladogram are disconcerting. The publication states that the palpi were not very useful for the study of phylogeny. One wonders if the examination of several species of each genus would have prevented these errors. (Also see Other Characters below under the genus *Cyclosa*.)

My own views are based on the study of genitalia, including the complex palpi, and the gross morphology of spiders, and are drawn from my generic revisions (Levi, 1995b). The phylogeny used is based on likely apomorphies. The genera of the Araneidae can be naturally arranged into four or five groups: (1) *Argiope* and *Gea*, which have the posterior eye row procurv-

ed and have reduced tapetum in the posterior lateral eyes. (2) *Cyrtophora*, *Manogea*, *Mecynogea* and *Kapogea*, which have the aggregate silk glands reduced or lacking and make horizontal dome-shaped webs without viscid silk. Both these groups have been accepted by Scharff and Coddington (1997), and follow Simon (1895). The third and fourth groups are even more distinct, but are confused in Scharff and Coddington (1997). (3) *Araneus* and others that lack a paramedian apophysis in the male palpus have the conductor on the edge of the tegulum, two patellar setae on the palpus and a palpus with a large distal hematodocha (distal hematodocha located between the embolus and terminal apophysis, when expanded, will turn the terminal apophysis) (Fig. 1). They may have the embolus with a cap and a round to oval abdomen, sometimes with shoulder humps or with a posterior median tubercle. (4) The largest clade, with *Alpaida* and *Cyclosa*, includes most of the neotropical araneid genera. They usually have a paramedian apophysis or conductor lobe in the palpus, the conductor in the middle of the tegulum, the embolus without a cap, and only one patellar seta on the palpus (Fig. 2). They lack distal hematodocha but may have macrosetae on the fourth coxae of males, and the abdomen shape is diverse,

frequently with a pair of posterior median tubercles. These paired tubercles are uncommon otherwise in spiders. Not all genera have all of the characters of their clade (e.g., *Eriophora* has two patellar setae on the palpus, some species of *Eriophora* have one and a second weak one; some *Araneus* species have only one). Also, the placement of some genera is uncertain at present.

## TAXONOMIC SECTION

### *Alloccyclosa* new genus

*Type Species.* *Cyclosa bifurca* (McCook). The generic name is feminine.

*Diagnosis.* *Alloccyclosa* differs from *Cyclosa* by having the abdomen posteriorly vertically biforked (Figs. 12, 13, 19). Also, the palpus has a different arrangement of sclerites, the conductor is a small tube (C in Fig. 21), the embolus (E) is short but parallel to the conductor and there is a large, complex, soft terminal apophysis (Figs. 20, 22, A in Fig. 21). Unlike the male of *Cyclosa* (Fig. 39) the *Alloccyclosa* male lacks a paramedian apophysis in its palpus and has only one patellar seta (Fig. 21). Males are only 35% of female size, there is no tooth on the endite and the hook on the first coxa and the corresponding groove on the second femur are absent.

*Relationship.* The web in *Alloccyclosa* has a vertical stabilimentum, similar to that made by *Cyclosa*.

There are remarkable similarities with *Cyrtophora* species. The biforked tail and humps, not found in other araneids, may be synapomorphies with similar structures in *Cyrtophora* (Levi, 1997, fig. 152). The epigynum with its central area soft (Figs. 6, 11), except for the wide scape in *Alloccyclosa*, resembles the anterior edge of the epigynum of *Cyrtophora* (Levi, 1997, fig. 148), and the lateral sclerotization on each side is also similar. Even the palpus has similarities with *Cyrtophora*: the conductor is short, the median apophysis has a spine and the terminal apophysis is soft.

The tapetum of the posterior median eyes is narrow, with rows of rhabdomes on the medial side as in most araneids (not in *Cyclosa*). The posterior lateral eyes may have a narrow tapetum similar to that of *Argiope*.

*Natural History.* *Alloccyclosa bifurca* habits are described in Levi (1977): females sit in the center of the web, as does *Cyclosa*. Above the spider is a line of overlapping egg sacs; below the spider is a line of detritus or wrapped prey. The spider is difficult to find. *Alloccyclosa bifurca* appear to be social, and males are very uncommon.

*Distribution.* Only one species is known, distributed from Florida to western Panama.

### *Alloccyclosa bifurca* (McCook), new combination

Figures 3–22; Map 1

*Cyrtophora bifurca* McCook, 1887: 342. Female, male syntypes from Fairyland, Merrit's Island, on the Indian River, Florida, in ANSP, lost.

*Cyclosa fissicauda* O. P.-Cambridge, 1889: 49, pl. 8, fig. 7, ♀. Fifteen syntypes in two vials from near Dolores, Guatemala, in BMNH, examined. Keyserling, 1893: 274, pl. 14, fig. 203, ♀.

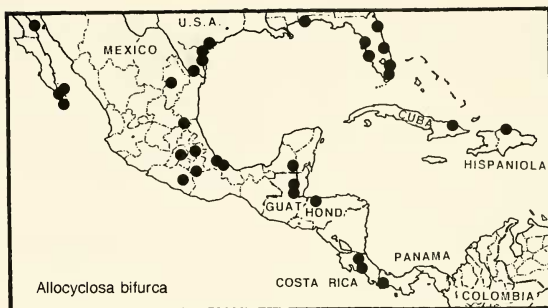
*Cyclosa bifurca*:—McCook, 1894: 227, pl. 17, figs. 9, 10, ♀, ♂. F. P.-Cambridge, 1904: 495, pl. 47, fig. 8, ♀, ♂. Roewer, 1942: 759. Bonnet, 1956: 1309. Levi, 1977: 86, pl. 5, figs. 78–89, ♀, ♂, map 2.

*Cyclosa furcata* O. P.-Cambridge, 1889: 247, pl. 31, fig. 3, ♀. Female syntypes from Amula, Guerrero, Mexico, in BMNH, examined. F. P.-Cambridge, 1904: 494, pl. 47, fig. 6, ♀, examined. Roewer, 1942: 760. Bonnet, 1956: 1316. NEW SYNONYMY.

*Note.* F. P.-Cambridge separates *C. furcata* from *C. bifurca* on the basis of the lack of dorsal, abdominal tubercles in *C. furcata*. But these are present in the syntype of *C. furcata* that I illustrated in 1975 (in my notes). Perhaps shrivelling with age emphasized previously inconspicuous tubercles. The specimen of *C. furcata* examined has a triangular-shaped scape (Figs. 9–11), which I believe is within the variation of *C. bifurca*.

*Description.* Female from Nuevo León, Mexico. Carapace yellowish (Fig. 13).





Map 1. Distribution of *Allocyclosa bifurca*.

Sternum dark brown with median and paired lateral white patches. Legs yellowish with narrow dark rings. Abdomen white with some indistinct, dorsal, paired dusky patches; venter with a pair of white bands, spinnerets brown with a narrow surrounding black ring (Figs. 13, 14). Posterior median eyes 0.8 diameter of anterior medians, anterior laterals 0.7 diameter, posterior laterals one diameter. Anterior median eyes their diameter apart, their diameter from laterals. Posterior median eyes 0.3 diameter apart, 2.1 diameters from laterals. Ocular trapezoid longer than wide, narrower behind than in front. Height of clypeus equals 0.9 diameter of anterior median eye. Abdomen with two pairs of humps and a biforked, median, posterior extension (Fig. 12). Total length 7.8 mm. Carapace 2.9 mm long, 2.2 wide in thoracic region, 1.1 wide behind posterior lateral eyes. First femur 3.4 mm, patella and tibia 3.5, metatarsus 2.1, tarsus 1.0. Second patella and tibia 3.1 mm, third 1.8, fourth 2.7. First and third femora the same length as corresponding patella and tibia, second and fourth slightly shorter.

Male from Florida. Cephalothorax yellowish white with large black eye rings. Legs with narrow black rings at distal ends of some articles. Abdomen white pigmented except in cardiac area, genital area and spinnerets, all of which are yellowish white. Posteriorly, dorsum has several in-

distinct black transverse lines of tiny black pigment spots (Fig. 19). Posterior median eyes 0.6 diameter of anterior medians, anterior laterals 0.3 diameter, posterior 0.6 diameter. Anterior median eyes 1.2 diameters apart, 0.4 diameter from anterior laterals. Posterior median eyes separated by 0.7 diameter, 2 diameters from posterior laterals. Ocular quadrangle is a trapezoid, as in female, wider than long, widest in front. Clypeus length equals 1 diameter of anterior median eye. Endite without tooth. Palpal patella with one macroseta. First coxa without hook. Abdomen with lateral and posterior tubercles indistinct. Total length 1.8 mm. Carapace 0.85 mm long, 0.77 wide in thoracic region, 0.39 wide behind posterior lateral eyes. First femur 1.10 mm, patella and tibia 1.10, metatarsus 0.62, tarsus 0.42. Second patella and tibia 0.87 mm, third 0.43, fourth 0.66. All femora slightly longer than corresponding patella and tibia.

*Note.* Living specimens are transparent green, with a red patch on the underside between epigynum and spinnerets. Both red and green pigments wash out in the preserving fluid.

Males are uncommon; they have paired tubercles at the posterior of the abdomen, as in the female.

*Variation.* Total length of females 5.1 to 8.5 mm. Figures 6 to 8 and 12 were made from a female from Nuevo León, Mexico,



Figures 9 to 11, 13, 14 were made from a syntype of *C. furcata*. Figures 3 to 5 and the male illustrated came from Dade County, Florida.

**Diagnosis.** Both body shape (Figs. 12–14) and lightly sclerotized genitalia separate this species from *Cyclosa*.

**Natural History.** Collected in the United States under eaves of buildings and in date palm, in Mexico by sweeping palmetto thicket in San Luis Potosí, in short tropical rain forest in Campeche, in thorn forest in Baja California Sur and on agave and *Pina raron* in Cuba.

**Distribution.** Florida, Texas and Baja California south to western Panama, Cuba and Hispaniola (Map 1).

**Specimens Examined.** UNITED STATES: Florida: *Citrus Co.*: 1 ♀ (Weed, MCZ). *Dade Co.*: Crandon Park, 27 Nov. 1952, 1 ♂ (A. M. Nadler, AMNH); Coral Gables, 11 Mar. 1976, 2 ♀ (V. Brach, MCZ). *Hillsborough Co.*: Hillsborough River State Park, 1 ♀ (MCZ). *Indian River Co.*: Sebastian, Dec. 1921, 3 ♀; Jan. 1922, 3 ♀; 30 Nov. 1931, 2 ♀; Jan. Feb. 1945, 1 ♀ (G. Nelson, MCZ). *Palm Beach Co.*: Palm Beach, Mar. 1909, 1 ♀ (F. Winslow, MCZ); Apr. 1920, 1 ♀ (T. Barbour, MCZ); Lake Worth, Apr. 1891, 2 ♀ (G. W. Peckham Coll., MCZ). *St. Johns Co.*: 27 Mar. 1959, 2 ♀ (J. McCrone, MCZ). *Alabama: Baldwin Co.*: Silverhill, Apr. 1946 1 ♀ (G. Nelson). *Texas: Aransas Co.*: Goose Isl. State Park, 15 June 1961, 4 ♀ (A. R. Brady). *Hidalgo Co.*: Pharr, 26 Dec. 1941, 1 ♀. *Keweenaw Co.*: 1.6 km S Riviera, 14 Nov. 1955, 1 ♀ (A. R. Brady); 46 km S Sarita, 14 Nov. 1955, 1 ♀ (A. R. Brady). *San Patricio Co.*: Lake Corpus Christi Dam, 25, 29 May 1983, 1 ♀ (W. Maddison). MEXICO: *Nuevo León*: Cola de Caballo, 21 May 1973, 3 ♀ (MCZ). *Baja California Norte*: Cerralba [Cerralvo] Isl., 7 June 1921, 2 ♀ (J. C. Chamberlin, MCZ). *Baja California Sur*: La Paz, 5 June 1921, 2 ♀ (J. C. Chamberlin, CAS, MCZ); E. of La Paz, 7 Sept. 1963, 1 ♀ (P. R. Craig, W. Hill, CAS); 9.6 km W San José del Cabo, Jan. 1982, 6 ♀ (D. Ubick, DU); Chialba Isl., 7 June 1921, imm. (J. C. Chamberlin, CAS). *San Luis Potosí*: Valles El Bañito, 27 June 1940, 1 ♀ (H. Hoogstraal, MCZ); Valles, hotel, 1961, 1 ♀ (L. Steude, AMNH). *Vera Cruz*: 12 km NW Alvarado, Highway 180, 15°50'N, 95°51'W, 25 June 1983, 1 ♀ (W. Maddison, R. S. Anderson, MCZ); Lago Catemago, La Jungla, 15°27'N, 95°05'W, 19 July 1991, 5 ♀ (W. H. Piel, G. S. Bodner, MCZ); Las Tuxtlas, 15 km N Catemaco, 50 m, Aug. 1986, 3 ♀ (W. Eberhard FNS-31, MCZ). *Hidalgo*: 4.5 km N Chapulhuacán, 21°11'N, 98°54'W, 20 April 1963, 1 imm. (W. J. Gertsch, W. Ivie, AMNH). *Distrito Federal*: México, Fall 1940, 1 ♀ (H. Wagner, AMNH). *Campeche*: Chicuma Ruins, 8 km

W Xpujil, 15°32'N, 89°31'W, 12–14 July 1983, 1 ♀ (W. Maddison, MCZ). GUATEMALA: *Petén*: Tikal, 7 July 1975, 2 ♀ (W. Sedgwick, MCZ); Petén Poptun, Finca Isobel, 7 Feb. 1980, 1 ♀, (V. Roth, AMNH). HONDURAS: *Atlántida*: Lancetilla, July 1929, 2 ♀, 4 imm. (A. M. Chickering, MCZ). COSTA RICA: *Heredia*: 15 km S Pto. Viejo, El Plástico, Feb. 1989, 1 ♀ (W. Eberhard, MCZ). *San José*: San José, 30 Sept. 1980, 1 ♀ (W. G. Eberhard, R. W. Work, MCZ). PANAMA: *Chiriquí*: Bugaba, 2 Nov. 1985, 1 ♀ (D. Quintero, MHUP).

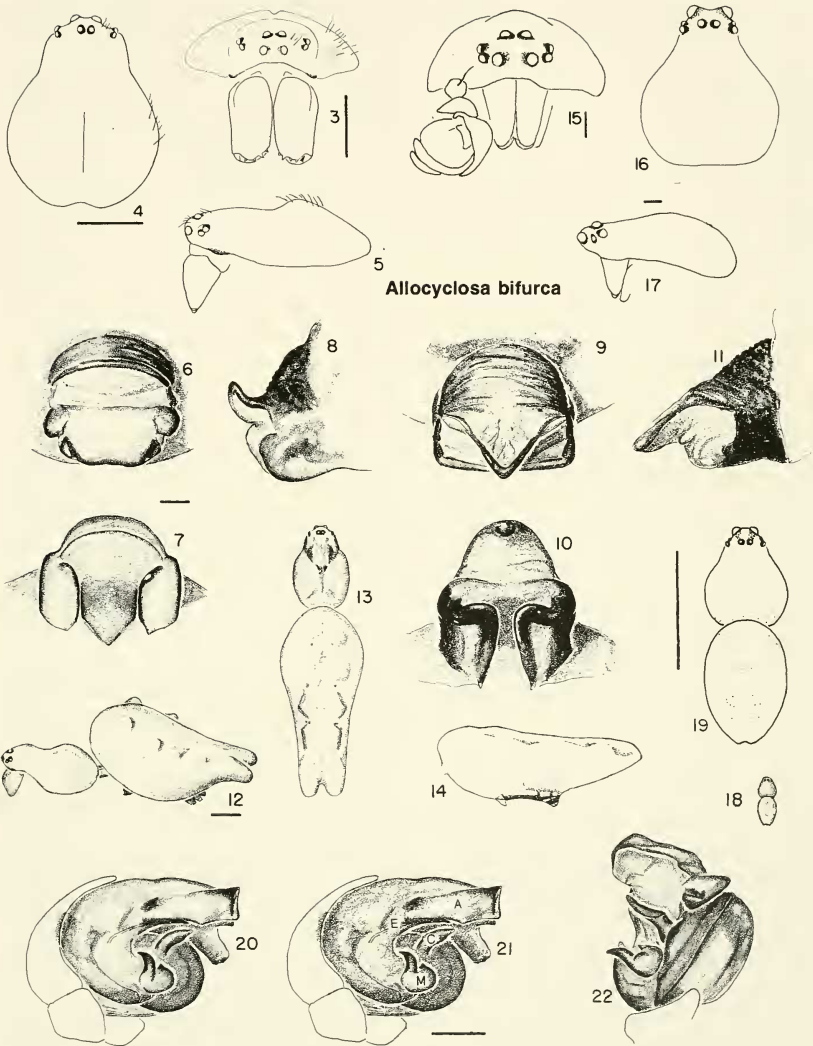
CUBA: *Holguín*: Banes, Aug. 1955, 6 ♀ (A. F. Archer, AMNH). HISPANIOLA: *Dominican Republic*: Puerto Plata, Apr., May 1941, 3 ♀ (D. Hurst, MCZ).

## *Cyclosa* Menge

*Cyclosa* Menge, 1866: 73. Type species *C. conica* (Pallas) by monotypy. Neave, 1939: 922. The gender of the name is feminine (Bonnet, 1956: 1306). *Tuerckheimia* O. P.-Cambridge, 1859: 46. Type species *T. nodosa*, designated by F. P.-Cambridge, 1904: 491. First synonymized with *Cyclosa* by F. P.-Cambridge (1904: 491).

*Parazygia* di Caporiacco, 1955: 345. Type species *P. accentotata* di Caporiacco [= *C. tapetifaciens* Hingston]. First synonymized by Levi (1977: 73).

**Diagnosis.** *Cyclosa* belongs to a group separated from other araneid genera by having a paramedian apophysis in the palpus, posterior median eyes adjacent and, unlike most araneid genera (except *Zygiella*), a full canoe-shaped tapetum in the posterior median eyes [i.e., lacking the araneid modification of a narrow tapetum with rows of rhabdomes toward the median of the spider (Homann, 1950)]. Unlike many araneids, *Cyclosa* usually has an abdomen that is longer than wide and that extends posteriorly beyond the spinnerets (Figs. 46, 66). There are black, paired, irregular marks or lines on the abdomen (Figs. 46, 59, 64) and between the genital groove and spinnerets; the venter has a pair of white patches separated by some distance from one another (Figs. 60, 90, 100). The pair of white patches may be on tubercles and may be separated by a third, median white patch (Figs. 100, 202). There is a black ring around the spinnerets. The cephalic region of males is less than half the width of the thorax (Fig. 28), and the length of the horizontal clypeus is equal to about 2 diameters of the anterior

***Allocyclosa bifurca***

Figures 3-22. *Allocyclosa bifurca* (McCook). 3-14, female. 3, eye region and chelicerae, lateral. 4, carapace. 5, carapace and chelicera, lateral. 6-11, epigynum. 6, 8, ventral. 7, 10, posterior. 8, 11, lateral. 12, sublateral. 13, dorsal. 14, abdomen lateral. 15-22, male. 15, eye region, chelicerae and right palpus. 16, carapace. 17, carapace and chelicera, lateral. 18, male in same proportion as Figures 12 and 13. 19, male dorsal. 20-22, left palpus. 20, 21, mesal. 22, ventral.

Abbreviations. A, terminal apophysis; C, conductor; E, embolus; M, median apophysis.

Scale lines: 1.0 mm; Figures 15-17 and palpi 0.1 mm.

median eye (Fig. 29). In many species there are additional tubercles on the abdomen (Figs. 277, 328, 348).

Most distinct are the genitalia: an epigynum divided by a scape (Fig. 31), sometimes annulate (*C. conica*, Figs. 42, 44), weakly sclerotized with an anterior depression on each side of the base of the scape, and an indistinct, almost invisible opening on each side (Fig. 31). The bulb of the palpus is usually wider than long, with a huge conductor holding the embolus in a gutter (Figs. 39, 41) and the base of the median apophysis close to the conductor.

All *Cyclosa* have long femora, the third often equal to or longer than the combined patella and tibia. (Sometimes the specimen used to measure these proportions is different from the one described.)

*Description.* Female. Carapace with few setae (Fig. 24). Sternum usually marked with a light anterior transverse bar and five light patches, both with indistinct borders (Fig. 38). Legs of most species yellowish with dark rings. Eyes subequal (Figs. 23, 24). Median eyes form a trapezoid, wider in front, usually slightly longer than width at anterior eyes (Figs. 23, 24). Anterior median eyes of females their diameter apart or slightly less, about the same distance or slightly more from laterals. Posterior median eyes touching to 0.4 diameter apart, 1.2 to 4 diameters from laterals (Figs. 23, 24). The height of the clypeus is slightly less than the diameter of the anterior median eyes. All species have similar genitalia, but the abdomen shape is variable. Abdomen often with pairs of tubercles (Figs. 277, 357, 372). Rarely, tubercles and posterior overhang are lost, as in *C. olivenca* and *C. vicirae* (Figs. 288, 296); nevertheless, genitalia place both with *Cyclosa*. In other parts of the world some *Cyclosa* species have a silvery abdomen.

Male. Males with anterior eyes separated by about their diameter, or slightly less, and about the same distance from laterals. Posterior median eyes touching or to about 0.3 diameter apart and 1.5 to 3 di-

ameters from laterals. Clypeus horizontal, almost parallel with sternum, and its length is 2 to 3 diameters of anterior median eye. All males with one strong patellar macroseta (Fig. 27). Males between 80 and 110% of size of female (as measured by width of carapace). All with a tooth on the endite facing the femur (Fig. 27), a minute hook on first coxa, laterally on posterior margin, and with a minute corresponding groove on second femur. Of species examined, only male of *C. conica* had a pair of macrosetae on fourth coxae (Fig. 48). Second tibiae (Fig. 30) usually with stronger setae than first.

*Other Characters.* Scharff and Coddington (1997) attribute additional characters to *Cyclosa*: *Cyclosa* is stated to have grooves and wrinkles on the booklung covers (p. 366). All araneids and tetragnathids (but apparently not theridiids) have corrugations on booklung covers if the size of the spider is larger than 8 to 10 mm. Presumably the corrugations strengthen the plate. American *Cyclosa* are small and lack these grooves and wrinkles, but they are present in *C. diversa* (12 mm) and *C. nodosa* (9.5 mm).

Scharff and Coddington's clade no. 50 indicates the paramedian apophysis is lost. On the contrary, it is usually present (Fig. 39). In the large *C. bifurcata*, if the conductor is torn off, the paramedian apophysis stays attached to the tegulum. In *C. caroli* and *C. tapetificiens*, the paramedian apophysis is attached to the membrane that connects conductor and tegulum. Only in *C. conica* does the paramedian apophysis attach to the conductor and appear as a lobe.

Clade no. 53 indicates the palpal conductor has a lobe. Usually no lobe is present, except in *C. conica*.

Clade no. 42 indicates that the carapace of *Cyclosa* is hairy. Not so. I have found only scattered fine setae on the *Cyclosa* specimens I examined.

Clade no. 43 indicates the palpus has a distal hematodocha and a terminal apophysis. American *Cyclosa* however lack a dis-



Map 2. Approximate number of *Cyclosa* species known from American regions.

tal hematodocha and often only have rudiments of the terminal apophysis (A in Fig. 39). A membrane between sclerites permits movement, but an expandable hematodocha is present only between the cymbium and subtegulum.

*Genitalia.* The conductor of the male palpus of *Cyclosa tapetifaciens* was examined carefully. In the left palpus it is attached with a small amount of soft tissue, in a small area to the left of the center of the tegulum. The soft tissue permits movement of the structure. The stalk of the paramedian apophysis (Fig. 39) is attached to the same, soft tissue; it is not attached to the conductor (except in *C. conica*).

*Function of the genitalia.* During mating, the tooth of the conductor hooks into the depression of the female's epigynum. Occasionally (but often in *C. diversa*) the tooth may break off (Figs. 411, 412) and remain stuck in the depression (Figs. 395, 396, 399). When this happens only one tooth is found per side.

The long filiform embolus enters an opening in the epigynum (Figs. 31, 32) that is not sclerotized and is difficult to see. (My observation in 1977 on the course of the embolus in the duct was wrong.) After entry, the embolus makes a distinct loop, visible in some epigyna through the lightly sclerotized median plate (Figs. 32,

57), and follows a canal along the margin of the posterior lateral plates around the median plate before entering the seminal receptacles (Figs. 32, 34–37). In a single female of four different species, the embolus had broken during mating and remained in the epigynum.

*Relationship.* The posterior median eyes of all *Cyclosa* have a canoe-shaped tapetum, a primitive character otherwise found only in *Zygiella* among the Araneidae (Homann, 1950).

All neotropical *Cyclosa* species have genitalia similar to the genitalia of nearctic *C. caroli* (Figs. 162–166, 173) and *C. turbinata* (Figs. 314, 315, 318). In all other *Cyclosa*, including *C. conica* (Figs. 42–45, 47), a holarctic species that extends into northern Mexico, the genitalia have heavier sclerotization, including the lobes and plates of the epigynum (Figs. 42, 43), and also have the palpal sclerites and the epigyna more diverse (Levi, 1977, figs. 21–37; Fig. 47). Also, *C. conica* is the only species in the Americas having a terminal apophysis (in the shape of an upside-down swimming duck, at 10h in Fig. 47). In the other American species, the conductor (C in Fig. 39) and median apophysis (M in Fig. 39) are similar in shape from species to species, and the terminal apophysis is lost or has a transparent, filiform line (A in Figs. 39, 40).

The differences among American *Cyclosa* species are limited to the relative proportions of the structures in the female epigynum and to minor differences in the tooth of the conductor and the armature of the median apophysis in the male palpus.

The details of the palpal structures of American *Cyclosa* males indicate interspecies relationships better than characteristics of the epigyna. In particular, males with a barb (Fig. 39) on the median apophysis, and a conductor tooth shaped like a parrot's beak (Fig. 41) probably are closely related. These criteria result in grouping females that may have the abdomen differently shaped (e.g., *C. walc-*

*kenaeri* and *C. turbinata*). I was not able to match males with females by comparing the structure of the epigynum with that of the palpus.

*Natural History.* All species make a fine-meshed vertical web with a vertical stabilimentum, the upper half of which may consist of overlapping egg sacs. The spider rests in the center and is difficult to see (Levi, 1977, pls. 1–4). The lower half of the stabilimentum consists of detritus and stored, wrapped food. The webs of *C. diversa* and *C. nodosa* have golden threads; others are known that have white silk (W. G. Eberhard, personal communication).

*Distribution.* *Cyclosa* species are found world-wide.

#### *Misplaced Species.*

*Cyclosa brevis*:—Alayón, 1993: 2, fig. 1, is an unnamed female *Wagneriana*.

*C. coexisterna* di Caporiacco, 1947: 25, is an immature *Mecynometa* (Tetragnathidae). NEW COMBINATION.

*C. minuscula* Mello-Leitão, 1940a: 179, is a *Dolichognatha* (Tetragnathidae). NEW COMBINATION.

*C. oliverioi* Soares and Camargo, 1945: 655, fig. 62, ♂, is an *Alpaida* male (with both palpi lost). NEW COMBINATION.

*C. paracensis* Mello-Leitão, 1937: 7, fig. 7, ♀, is a *Mecynometa* (Tetragnathidae). NEW COMBINATION.

*C. punctata* Keyserling, 1880: 312, pl. 4, fig. 14, ♀, from Rio de Janeiro State, Brazil, is of uncertain placement. (See Appendix and Figs. 433, 434.)

*C. v-notata* Petrunkevitch, 1925: 115, fig. 29–31, ♀, is *Argyrodes caudatus* (Taczanowski), Theridiidae. NEW SYNONYMY.

*Larinia silvestris* Bryant, 1942: 5, figs 5, 7, 10, 11, ♀, ♂, erroneously placed in *Cyclosa* by Harrod et al. (1991), is a *Metazygia*. NEW COMBINATION. (See Appendix and Figs. 430–432.)

*Turckheimia moraballi* Hingston, 1932: 369 is *Paracixia kochi* (Taczanowski) (Levi, 1995a).

*T. tuberculata* Hingston, 1932: 368 is *Paracixia kochi* (Taczanowski) (Levi, 1995a).

#### *Unknown Species.*

*Cyclosa tricolor* Mello-Leitão, 1940b: 202, changed by Brignoli (1983: 266) to *C. tricolorata*, has type lost.

*Separating American Species.* Specimens from different localities often differ in details of their genitalia, as do individ-



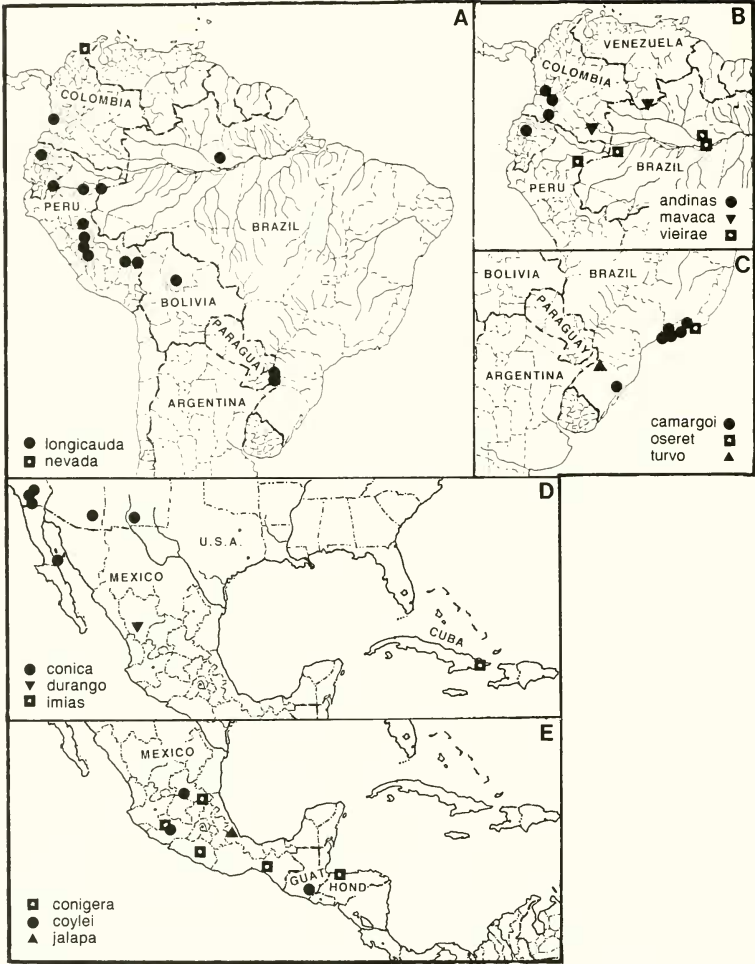
uals of the same species collected in the same area. Although the relatively soft epigyna are all quite similar, females can be separated by the shape of the abdomen. Nevertheless, females that have oviposited or dried up may have tubercles that are not found in a well-fed and well-preserved individual (Fig. 170).

Separating males presents a challenge. In some species the abdomen of a large male is similar to that of the female, but in smaller individuals differs by lacking tubercles and may have an oval shape. For males, the abdomen should be used as a last resort to distinguish between species with similar palpi. Diagnostic features of males include the sclerotized tooth of the conductor (Fig. 41), which is almost always partly hidden by a flap attached to the tip of the gutter (Fig. 41), the armature of the median apophysis (at 4h in Fig. 39), which may be partly hidden by the overhanging conductor and the tip of the conductor in apical view (Fig. 83). But the tip of the conductor in apical view is more variable than the armature of the median apophysis. The embolus, a thread in the gutter of the conductor, with its swollen base visible on the dorsal side of the palpus (at 3h in Fig. 375), is similar in all species. Above the embolus (Fig. 375) lies the soft terminal apophysis, an indistinct structure in all American species.

KEY TO FEMALE MEXICAN AND NEOTROPICAL  
CYCLOSA

- |         |  |                    |
|---------|--|--------------------|
| 5(2).   | Anterior pair of tubercles bulbous (Figs. 415, 420, 423, 427) .....  | 6                  |
| -       | Anterior pair of tubercles small (Figs. 389, 404) .....  | 9                  |
| 6(5).   | Abdomen with lightly sclerotized plates (Figs. 423, 427) .....   | 7                  |
| -       | Abdomen with streaks .....   | 8                  |
| 7(6).   | Central America (Map 6F); epigynum as in Figures 425, 426 .....  | <i>nolosa</i>      |
| -       | Cuba (Map 6F); epigynum as in Figures 421, 422 .....   | <i>alayoni</i>     |
| 8(6).   | Trinidad (Map 6F); epigynum as in Figures 417, 418 .....   | <i>tananaco</i>    |
| -       | Curaçao (Map 6F); epigynum as in Figures 413, 414 .....  | <i>ojeda</i>       |
| 9(5).   | Scape club-shaped, narrow, long, widest at distal end (Figs. 387, 391, 393, 395, 397) .....  | 10                 |
| -       | Scape otherwise (Figs. 322, 324, 333, 335, 344, 354, 363) .....  | 11                 |
| 10(9).  | A diagonal groove on each side of epigynum in posterior view (at 10h, 2h in Fig. 385); Mato Grosso, southern Brazil to northern Argentina (Map 6E) ..... | <i>cicente</i>     |
| -       | No such groove (Figs. 392, 394, 396, 398, 400); widespread (Map 8B) .....  | <i>diversa</i>     |
| 11(9).  | Scape circular and stalked (Fig. 378); Costa Rica (Map 8B) .....   | <i>jose</i>        |
| -       | Scape with more or less parallel sides (Figs. 322, 333, 344) .....   | 12                 |
| 12(11). | Abdomen short, almost as wide as long (Figs. 346, 348); Baja California (Map 7A) .....   | <i>pichilingue</i> |
| -       | Abdomen longer than wide (Figs. 337, 338) .....  | 13                 |
| 13(12). | Scape narrow, 3 to 5 times as long as wide, with parallel sides (Figs. 333, 335); Florida, southern Texas to West Indies, Guianas (Map 7A) .....         | <i>walckenaeri</i> |
| -       | Scape wider, 1.3 to 2.5 times as long as wide (Figs. 322, 324, 354); posterior median plate small (Figs. 323, 325, 355) .....                            | 14                 |
| 14(13). | Scape wide, 1.5 times as long as wide (Figs. 322, 324); posterior median plate small (Figs. 323, 325); California to Peru (Map 7B) .....                 | <i>berlandi</i>    |
| -       | Scape narrow, 2.5 times as long as wide (Fig. 354); posterior median plate lobed (Fig. 355); Argentina, Chile (Map 6E) .....                             | <i>serena</i>      |
| 15(1).  | Abdomen spherical, with or without posterior median tubercle (Figs. 288, 296); Amazon area .....   | 16                 |
| -       | Abdomen elongate with a median, dorsal posterior extension (Figs. 251, 277, 308, 316) .....  | 17                 |
| 16(15). | Abdomen with posterior dorsal knob (Figs. 296, 327); Amazon area (Map 6D) .....  | <i>olivencia</i>   |
| -       | Abdomen without posterior dorsal knob  |                    |
| 1.      | Abdomen with 5 or 6 tubercles (Figs. 328, 357, 372, 420) .....   | 2                  |
| -       | Abdomen with fewer tubercles (Figs. 46, 80, 269, 277, 296) .....   | 15                 |
| 2(1).   | Abdomen with 5 tubercles, or 6 with median, posterior, upper tubercle minute (Figs. 365, 367, 370-372) .....   | 3                  |
| -       | Abdomen with 6 tubercles (Figs. 382, 389, 390, 402, 403, 420) .....  | 5                  |
| 3(2).   | Epigynum scape with narrow neck (Fig. 368); widespread (Map 8A) .....  | <i>bifurcata</i>   |
| -       | Epigynum with wide scape without neck, as in Figures 354, 363 .....  | 4                  |
| 4(3).   | Hispaniola, Jamaica, Puerto Rico (Figs. 363-367; Map 8A) .....   | <i>haiti</i>       |
| -       | Argentina, Chile (Figs. 354-355; Map 6E) .....   | <i>serena</i>      |

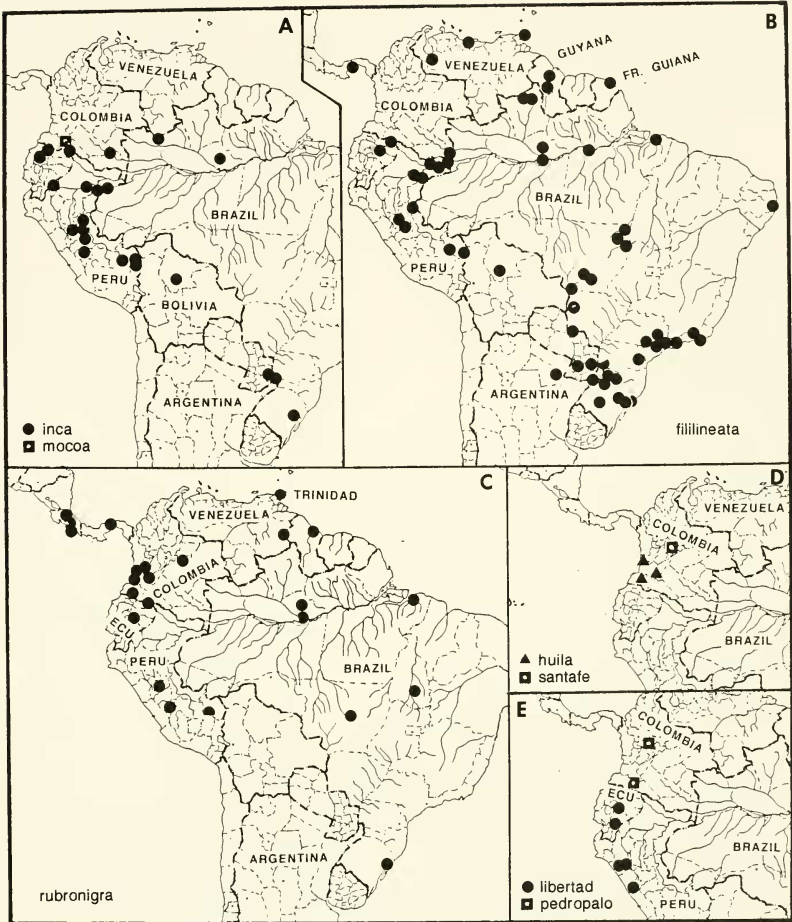




Map 3. Distribution of *Cyclosa* species.

(Figs. 255, 259): Amazon area (Map 3B) ..... *vieirae*  
 17(15). Abdomen with an anterior pair of dorsal tubercles (Figs. 235, 277, 316) 18  
 - Abdomen without anterior pair of tubercles (Figs. 46, 56, 61) ..... 25

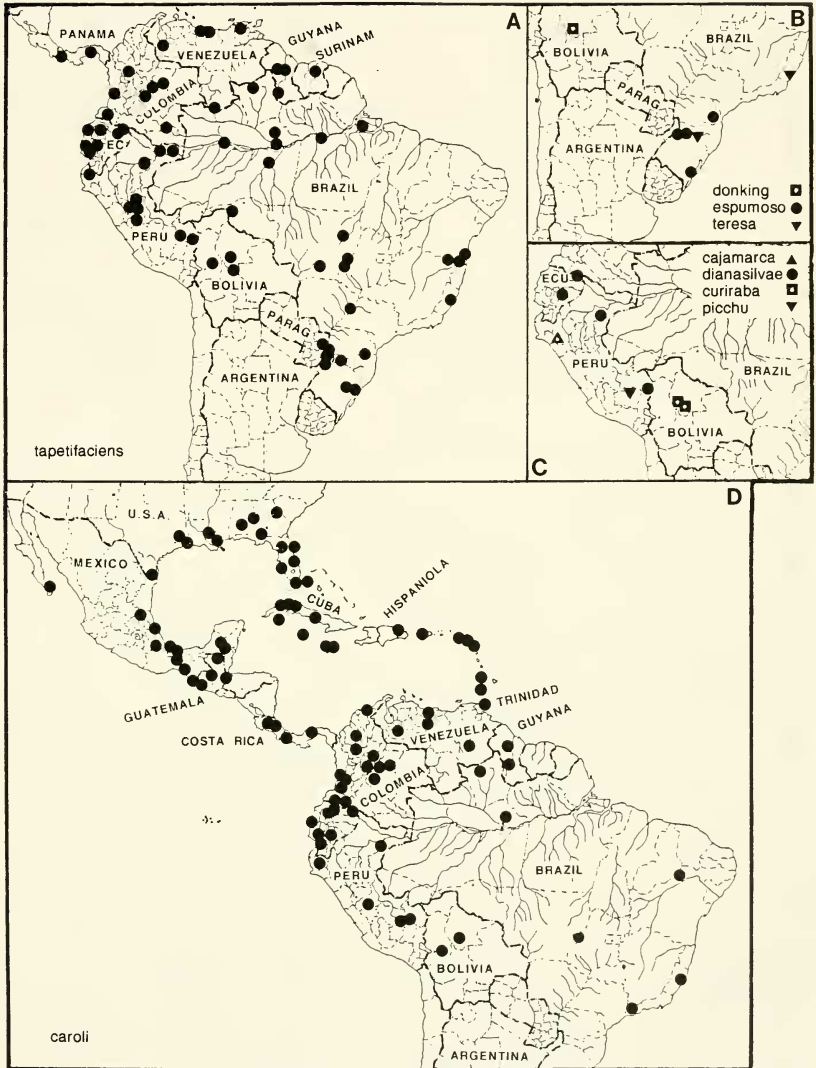
18(17). Anterior pair of tubercles tipped by nipples (Fig. 277): Mexico, Lesser Antilles to Venezuela and Peru (Map 6D) ..... *triquetra*  
 - Anterior pair of tubercles rounded (Figs. 235, 259, 308) ..... 19



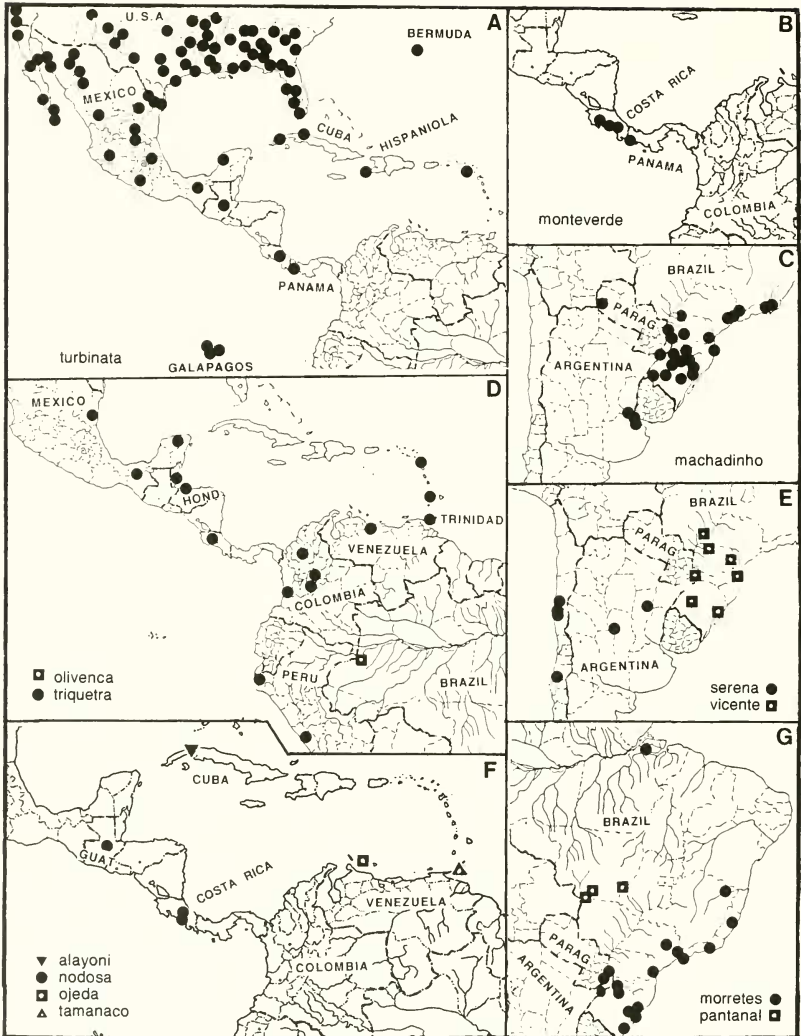
Map 4. Distribution of *Cyclosa* species.

- |  |              |  |   |                   |
|--|--------------|--|---|-------------------|
| 19(18). Scape of epigynum narrow, its length more than 4 times its width (Figs. 49, 50); Cuba (Map 3D) ..... | <i>imias</i> | —  | (Figs. 304, 305); Costa Rica to Panama (Map 6B) .....   | <i>monteverde</i> |
| — Scape wider, length about 2 to 3 times its width (Figs. 304, 314) .....                                    | 20           | —  | Epigynum with small openings near posterior margin (Figs. 314, 315); United States, to Panama, Bermuda, Greater Antilles, Galapagos (Map 6A) .. | <i>turbinata</i>  |
| 20(19). Cuba, Mexico, Central America, Galapagos .....   | 21           | 22(20). Peru .....                                     |   | 23                |
| — South America .....  | 22           | — Southeastern South America .....                     |   | 24                |
| 21(20). Epigynum with large circular openings .....  |              | 23(22). Openings anterior in ventral view and at ..... |   |                   |

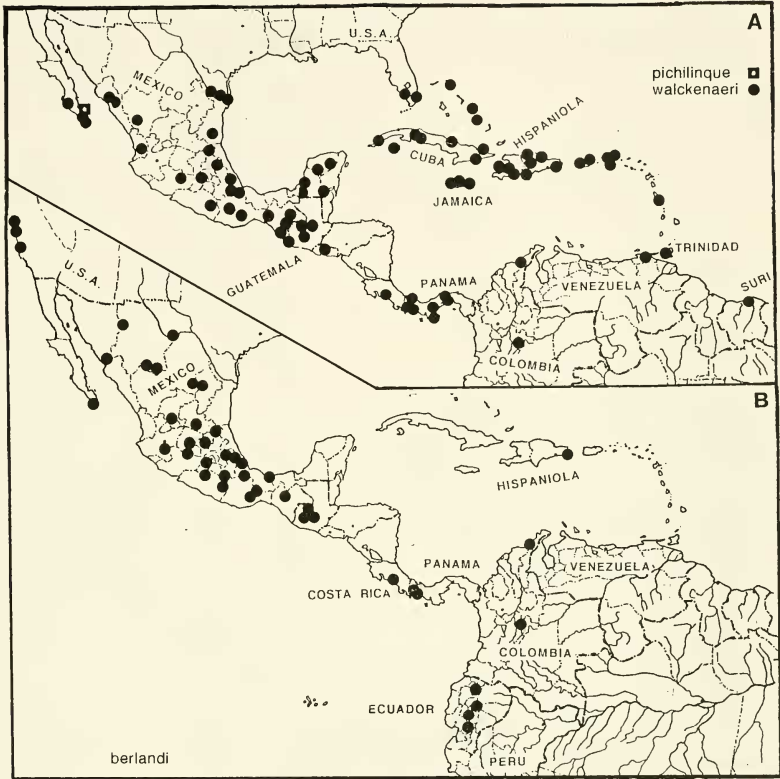
	an angle to the median (Fig. 236); Ecuador, western Peru (Map 4E) <i>libertad</i>		gynum (Fig. 223); Peruvian Amazon area (Map 5C) <i>dianasilvac</i>
—	Openings in midline of epigynum and almost parallel (Fig. 232); Peruvian Andes (Map 5C) <i>cajamarca</i>		Epigynum otherwise 34
24(22).	Openings seemingly in a loop on each side of scape (Fig. 265); southern Brazil (Map 6C) <i>machadinho</i>	34(33).	Epigynum with sclerotized triangle on each side, lateral to base of scape (Figs. 71-73); Mexico (Map 3D) <i>durango</i>
—	Openings on sides (Fig. 256); on each side of scape a granulated surface or dried mucus (Fig. 256); southern Brazil (Map 6C) <i>morretes</i>	—	Epigynum without these triangles (Figs. 86, 146) 35
25(17).	Scape circular with a neck (Figs. 162, 165, 199, 204, 208, 212) 26	35(34).	Epigynum with lip of opening circular (Figs. 86, 146) 36
—	Scape elongate (Figs. 42, 195) 30	—	Epigynum with straight openings (Figs. 181, 183, 154, 240, 248) 37
26(25).	Scape width greater than width of base on each side (Figs. 208, 209); Amazon area (Map 3B) <i>navaca</i>	36(35).	Posterior lateral plates narrow, median area large (Fig. 87); widespread (Map 4A) <i>inca</i>
—	Side of epigynum base wider on each side than width of scape (Figs. 199, 204, 212) 27	—	Posterior median area small (Fig. 147); Bogota, Colombia (Map 4D) <i>santafe</i>
27(26).	Width of base on each side of scape about 1.5 times width of scape (Figs. 212, 214); body cylindrical (Figs. 216, 217); southern Brazil (Map 3C) <i>camargoi</i>	37(35).	Scape wide, about as wide as cross-section of brow on each side (Figs. 181, 183); widespread from Panama to northern Argentina (Map 5A) <i>tapetifaciens</i>
—	Width of base on each side is 1.5 times or more than scape width, abdomen narrows posteriorly, cone-shaped (Figs. 203, 206) 28	—	Epigynum otherwise 38
28(27).	Brow almost vertical on each side of scape (Fig. 204); southern Brazil (Map 3C) <i>turvo</i>	38(37).	Depression on each side with two lips (Fig. 154); southern Colombia (Map 4D) <i>huila</i>
—	Epigynum otherwise 29	—	Depression with one lip in ventral view (Fig. 248) 39
29(28).	A distinct, circular depression on each side of scape neck (Fig. 199); south-eastern Brazil (Map 3C) <i>oseret</i>	39(38).	Epigynum as in Figure 248; Pantanal area, Mato Grosso (Map 6G) <i>pantanal</i>
—	Depression hidden under each side of neck of scape, often with circular brows (Figs. 162, 164, 165); widespread (Map 5D) <i>caroli</i>	—	Epigynum as in Figure 240, with scape narrow; Bolivia (Map 5C) <i>curiraba</i>
30(25).	Scape wide, pointed, with brow posterior to base of scape (Fig. 195, 196); northern Bolivia (Map 5B) <i>donking</i>	40(31).	A wide groove below scape, appearing as a wide notch on anterior margin in posterior view (Fig. 119); Amazon, western Peru to northern Argentina (Map 3A) <i>longicanda</i>
—	Epigynum otherwise 31	—	Epigynum without groove under scape (Figs. 58, 63, 87, 97) 41
31(30).	Abdomen short and wide (Fig. 46); in lateral view, spinnerets near midline or in posterior half of abdomen (Figs. 46, 76, 91, 149, 157, 187, 227) 32	41(40).	Depression and brow on each side of scape wider than area lateral to it (Fig. 57); Mexico to Honduras (Map 3E) <i>conigera</i>
—	Abdomen elongate, spinnerets in anterior half of abdomen (Figs. 61, 66, 70, 112, 121) 40	—	Epigynum base with lateral area wider than depression (Fig. 96) 42
32(31).	Scape with annuli (Fig. 42); base of epigynum with sclerotized, lateral lobes folded over median area (Fig. 42); holarctic to northern Mexico (Map 3D) <i>conica</i>	42(41).	Depression diameter less than width of scape (Figs. 96, 98), depression circled by brow; Mexico to northern Argentina (Map 4B) 43
—	Scape without annuli (Fig. 31); base of epigynum otherwise (Fig. 31) 33	—	Depression diameter wider than width of scape (Figs. 62, 77, 86) 44
33(32).	Depression and brow on each side of scape wider than side of base of epigynum (Fig. 223); Peruvian Amazon area (Map 5C) <i>dianasilvac</i>	43(42).	Abdomen cylindrical, with posterior swelling (Figs. 216, 217); southern Brazil (Map 3C) <i>camargoi</i>
—	Epigynum otherwise 34	—	Abdomen tapering to a point posteriorly (Figs. 99-101); Mexico to northern Argentina (Map 4B) <i>filincata</i>
24(22).	Openings seemingly in a loop on each side of scape (Fig. 265); southern Brazil (Map 6C) <i>machadinho</i>	44(42).	Opening with large circular lip, about its diameter from scape (Figs. 77, 86, 108) 45



Map 5. Distribution of *Cyclosa* species.



Map 6. Distribution of *Cyclosa* species.



Map 7. Distribution of *Cyclosa* species.

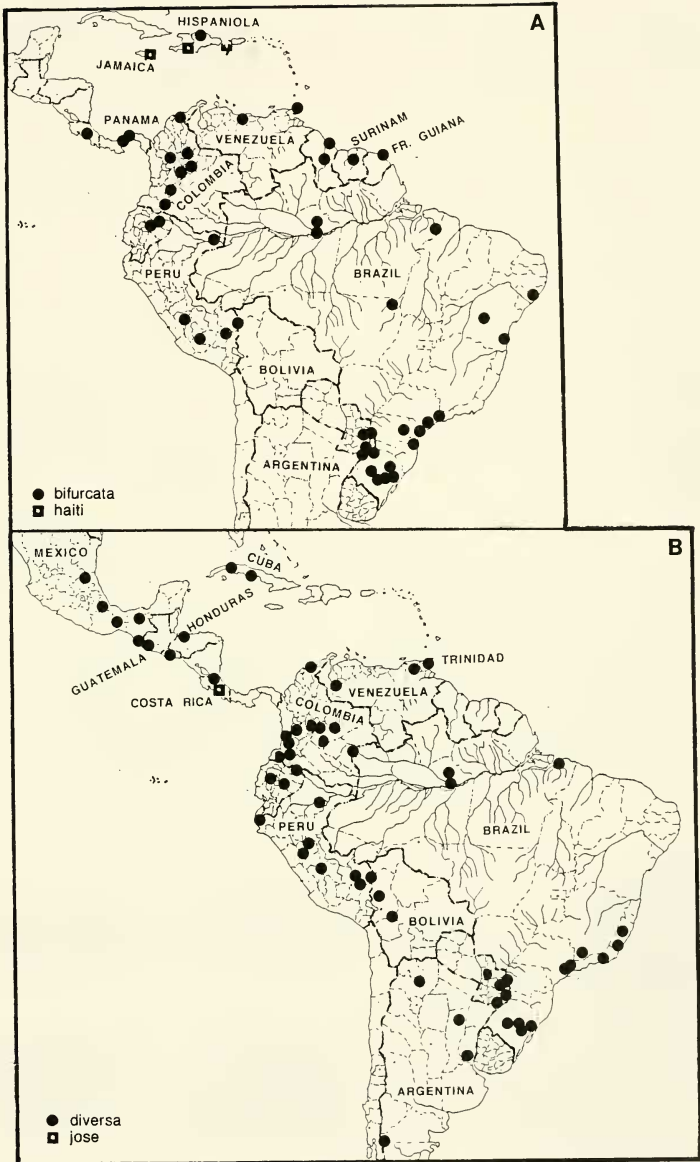
- |         |   |             |         |   |                 |
|---------|---|-------------|---------|---|-----------------|
| —       | Opening with straight lip or slightly curved lip (Figs. 53, 62, 67, 138) .....                                | 47          | —       | base of scape (Fig. 62); Mexico, Guatemala (Map 3E) .....   | <i>coylei</i>   |
| 45(44). | Depression of epigynum with a brow (Figs. 78, 87) .....   | 46          | —       | Anterior lip and brow of depression on each side of base of scape (Fig. 53); Mexico (Map 3E) .....    | <i>jalapa</i>   |
| —       | Depression of epigynum without brow (Fig. 108); southern Colombia to northern Ecuadorian Andes (Map 3B) ..... |             | 49(47). | Ecuador, Peru; epigynum with straight openings at an angle to median axis (Fig. 236) .....            | <i>libertad</i> |
| —       | .....   |             | —       | Colombia; epigynum otherwise (Figs. 67, 127, 138) .....   | 50              |
| 46(45). | In posterior view, lateral plates narrow (Fig. 87); widespread (Map 4A) .....                                 | <i>inca</i> | 50(49). | Opening posterior, not visible in ventral view (Fig. 128); northern Colombia mountains (Map 3A) ..... | <i>nevada</i>   |
| —       | In posterior view, lateral plates wider (Fig. 78); widespread (Map 4C) .....                                  |             | —       | Opening visible ventrally .....   | 51              |
| —       | .....   |             | 48(47). | A deep, wide depression on each side of   |                 |
| 47(44). | Mexico .....  | 48          | —       | Posterior median plate wider than long  |                 |
| —       | Colombia to Peru .....  | 49          |         |   |                 |
| 48(47). | A deep, wide depression on each side of   |             |         |   |                 |



(Fig. 139); Depto. Cundinamarca, Colombia (Map 4E) ..... *pedropalo*  
 - Posterior median plate as wide as long (Fig. 65); southern Colombian Andes (Map 4A) ..... *mocou*

KEY TO MALE MEXICAN AND NEOTROPICAL  
 CYCLOSA

1.	Fourth coxa with two macrosetae (Fig. 48); a large, nonsclerotized terminal apophysis with wrinkles (at 10h in Fig. 47); holartic to northern Mexico (Map 3D) ..... <i>conica</i>	
-	Fourth coxa without macrosetae; terminal apophysis filamentous (A in Fig. 39) or hidden behind cymbium (at 3h in Fig. 375) ..... 2	
2(1).	Conductor tooth broken off (Figs. 411, 412); widespread (Map 5B) ..... <i>diversa</i>	
-	Conductor tooth present ..... 3	
3(2).	Conductor tooth saber-like, almost half length of conductor or longer (Figs. 52, 54, 93, 94, 374, 376, 408) ..... 4	
-	Conductor tooth small (Figs. 39, 41, 103) ..... 5	
4(3).	Tooth shorter than half length of conductor (Figs. 52-55); widespread (Map 4C) ..... <i>rubronigra</i>	
-	Tooth longer than half length of conductor (Figs. 93, 94, 374, 385, 409, 410) ..... 5	
5(4).	Conductor projecting beyond tegulum (Figs. 374-376) ..... 6	
-	Conductor not projecting beyond tegulum (Figs. 93, 94, 407, 408) ..... 7	
6(5).	Median apophysis with lobe as long as wide (Fig. 377); widespread (Map 5A) ..... <i>bifurcata</i>	
-	Median apophysis lobe wider than long (Fig. 356); Costa Rica (Map 5B) ..... <i>jose</i>	
7(5).	Conductor tooth gracefully curved, S-shape in apical view (Fig. 94); widespread (Map 4A) ..... <i>inca</i>	
-	Conductor tooth straight to slightly curved (Figs. 407, 409); widespread (Map 5B) ..... <i>diversa</i>	
8(3).	Median apophysis with upright tooth on its inner margin (Figs. 360, 362); Argentina, Chile (Map 6E) ..... <i>serena</i>	
-	Median apophysis without such tooth (Figs. 39, 342, 352) ..... 9	
9(5).	Median apophysis with rows of denticles forming a triangle as in Figures 135, 137; northern Colombian mountains (Map 3A) ..... <i>nevada</i>	
-	Median apophysis otherwise ..... 10	
10(9).	Conductor tooth thin or only a sliver visible above flap (Figs. 103, 106, 114, 143) ..... 11	
-	Conductor tooth almost as wide as long, parrot beak-shaped (Figs. 41, 159, 173, 177) ..... 22	
11(10).	Median apophysis with a barb on inner margin (Figs. 39, 153, 320, 343) ..... 16	
-	Median apophysis without barb (Figs. 172, 194) ..... 12	
12(11).	Conductor tooth wide (Fig. 143); conductor flap thick, sclerotized (Fig. 144); anterior margin of median apophysis with two overlapping ridges (Fig. 145); Depto. Cundinamarca, Colombia (Map 4E) ..... <i>pedropalo</i>	
-	Conductor tooth narrower (Figs. 103, 300); conductor flap thin, soft (Figs. 106, 301); median apophysis otherwise (Figs. 105, 107) ..... 13	
13(12).	Lobe of median apophysis asymmetrical, separated by its width from distal tooth (Figs. 107, 302, 303) ..... 14	
-	Median apophysis otherwise (Figs. 231, 247) ..... 15	
14(13).	Notch of conductor short and narrow with parallel sides (at 3h in Fig. 301); southern Brazil (Map 5B) ..... <i>espumoso</i>	
-	Notch of conductor wide (Fig. 104); Mexico to northern Argentina (Map 4B) ..... <i>fililineata</i>	
15(13).	Median apophysis with gap between lobe and distal tooth (Fig. 231); Peruvian Amazon area (Map 5C) ..... <i>dianasilvae</i>	
-	Edge of median apophysis lobe continuous with tooth (Fig. 247); Peruvian Andes (Map 5C) ..... <i>picchu</i>	
16(11).	Median apophysis with lobe and tooth (Fig. 312, 332) ..... 17	
-	Median apophysis with keel on anterior margin (Fig. 321) ..... 18	
17(16).	Abdomen with one posterior tubercle, or oval in outline (Fig. 309); Costa Rica to Panama (Map 6B) ..... <i>monteverde</i>	
-	Abdomen with three posterior tubercles (Fig. 329); California to Peru (Map 7B) ..... <i>berlandi</i>	
18(16).	Notch of conductor with two curved parallel sides (at 4h in Fig. 152); Bogota, Colombia (Map 4D) ..... <i>santafe</i>	
-	Notch of conductor otherwise (Figs. 319, 341, 351) ..... 19	
19(15).	Abdomen as long as wide (Fig. 349); Baja California (Map 7A) ..... <i>pichilincue</i>	
-	Abdomen longer than wide (Figs. 317, 339) ..... 20	
20(19).	Conductor lobe encircling tip of tooth and gutter (Fig. 342) ..... 21	
-	Conductor lobe short (Fig. 116); southern Colombia to northern Ecuadorian Andes (Map 3B) ..... <i>andinas</i>	
21(20).	Abdomen with median extension (Fig. 317); United States to Panama, Ber-	



Map 8. Distribution of *Cyclosa* species.

- muda, Greater Antilles, Galapagos (Map 6A) *turbinata*
- Abdomen with three posterior tubercles (Fig. 339); Florida, southern Texas and Guiana, West Indies (Map 7A) *walckenaeri*
- 22(10). Abdomen spherical (Fig. 290); Amazon area (Map 3B) *viciac*
- Abdomen longer than wide (Fig. 122) 23
- 23(22). Median apophysis with gap between lobe and distal tooth (Fig. 126); Amazon, western Peru to northern Argentina (Map 3A) *longicauda*
- Median apophysis with lobe and tooth adjacent (Figs. 172, 194) 24
- 24(23). Conductor lobe projecting midway above length of tooth, (arrow on Fig. 173; Fig. 177); wide notch in apical view (Figs. 175, 179); median apophysis tooth as long as height of lobe (Fig. 172); widespread (Map 5D) *caroli*
- Conductor lobe and median apophysis otherwise (Figs. 192, 194, 281) 25
- 25(24). Conductor notch with acute angle at end (Fig. 220); southeastern Brazil (Map 5B) *teresa*
- Conductor notch otherwise (Figs. 160, 282) 26
- 26(25). Conductor tooth round, median apophysis with small tooth (Figs. 281, 283); Mexico, Lesser Antilles, Venezuela to Peru (Map 6D) *triquetra*
- Conductor tooth (Figs. 253, 261, 271) and median apophysis otherwise (Figs. 264, 274) 27
- 27(26). Conductor notch about three times as long as wide with parallel sides (Fig. 192); median apophysis with small distal tooth (Fig. 194); widespread from Panama to northern Argentina (Map 5A) *tapetifaciens*
- Conductor notch (Figs. 254, 272) and median apophysis otherwise (Figs. 264, 274) 28
- 25(27). Conductor notch wide, spreading (Fig. 262); median apophysis tooth behind lobe, pointing proximally (Figs. 263, 264); southern Brazil (Map 6G) *morretes*
- Conductor notch with sides parallel (Figs. 254, 272); median apophysis otherwise (Figs. 161, 255, 273) 29
- 29(25). Median apophysis tooth pointing toward gutter (Fig. 161); southern Colombia (Map 4D) *huila*
- Median apophysis tooth with greater curvature, pointing backwards (Figs. 255, 273) 30
- 30(29). Conductor notch narrow, twice as long as wide (Fig. 272); southern Brazil (Map 6C) *machadinho*
- Conductor notch wider, 1.5 times as long as wide (Fig. 254); Pantanal, Mato Grosso (Map 6G) *pantanal*

*Cyclosa conica* (Pallas)

Figures 42–48; Map 3D

*Aranca conica* Pallas, 1772: 48, pl. 1, fig. 16. Female specimen from Germany, believed lost.*Cyclosa conica*.—Levi, 1977: 78, pl. 1, figs. 1–19, ♂, map 1.**Variation.** Total length of females 3.6 to 7.9 mm, males 3.5 to 4.9.**Diagnosis.** The species is easily distinguished from all other Mexican and neotropical *Cyclosa* by the more heavily sclerotized genitalia, by having the scape annulate (Figs. 42, 44), having a sclerotized lobe on each side of the epigynum bent toward the scape (Figs. 42, 44) and by having the terminal apophysis in the palpus in

Figures 23–30. *Cyclosa* morphology. 23–25, female of *C. tapetifaciens*. 23, eye region and chelicerae. 24, carapace and chelicera, lateral. 26, carapace and chelicerae of *C. bifurcata*, lateral. 27–30, male of *C. tapetifaciens*. 27, eye region, chelicerae and right palpus. 28, carapace. 29, carapace and chelicera, lateral. 30, anterior of left second patella and tibia of male.

Figures 31–37. Epigynum, diagrammatic. 31, ventral. 32, posterior. 33, lateral. 34, 35, *C. nevada* with broken embolus. 34, ventral. 35, posterior. 36, 37, *C. fillineata* with broken embolus. 36, ventral. 37, Dorsal.

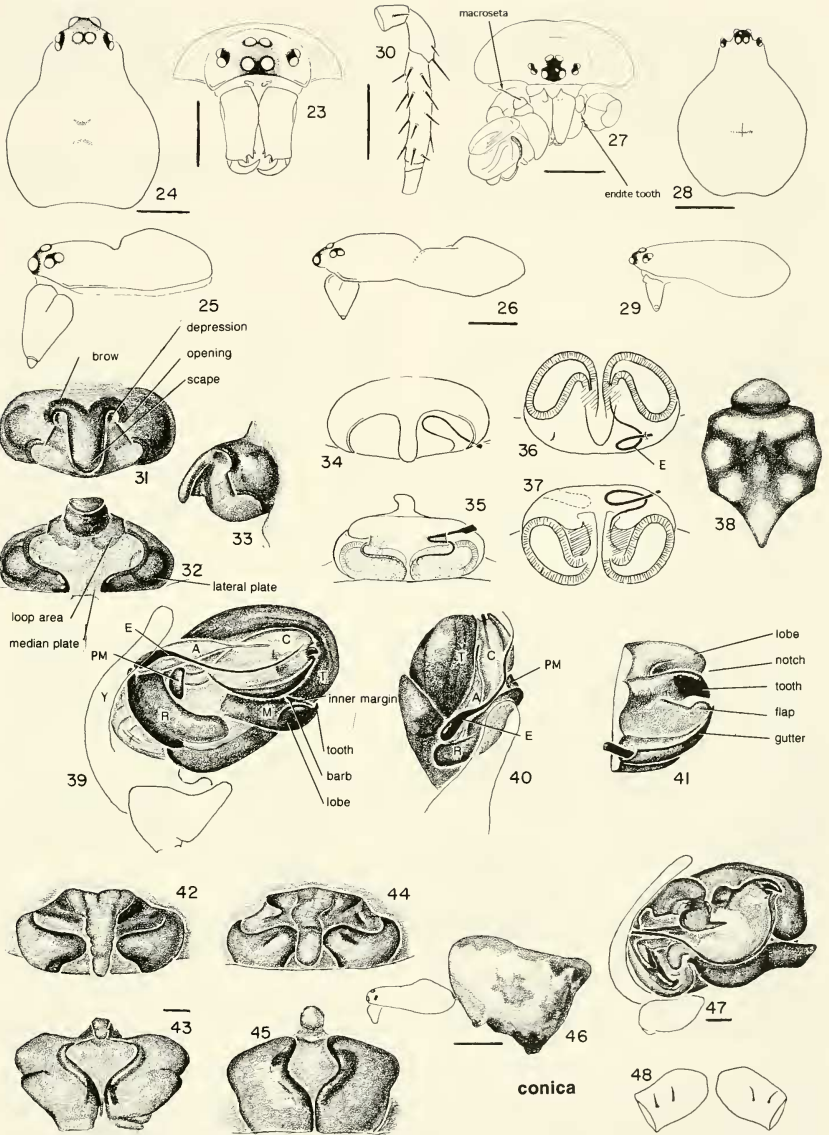
Figure 38. Sternum maculation, *C. walckenaeri*.

Figures 39–41. Male left palpus. 39, mesal, expanded. 40, dorsal, expanded. 41, tip of conductor, pulled apart, diagrammatic.

Figures 42–48. *Cyclosa conica* (Pallas). 42–46, female. 42–45, epigynum. 42, 44, ventral. 43, 45, posterior. 42, 43, (New Hampshire). 44, 45, (Baja California). 46, lateral. 47, 48, male. 47, left male palpus. 48, fourth coxae.

**Abbreviations.** A, terminal apophysis; C, conductor; E, embolus; M, median apophysis; PM, paramedian apophysis; R, radix; T, tegulum; Y, cymbium.

**Scale lines:** 1.0 mm; genitalia 0.1 mm.



the shape of an upside-down duck head and torso (A at 10h in Fig. 47). All other *Cyclosa* in Mexico and the neotropics have a transparent rod as terminal apophysis or seem to lack the structure entirely.

*Natural History.* See Levi, 1977: 79.

*Distribution.* Holarctic, common in America from Alaska to West Virginia, southern Illinois to southern New Mexico and Baja California (Map 3D).

*Specimens Examined.* MEXICO *Baja California Norte:* Isla San Lorenzo, north end, 28°40'N, 112°52'W, 24 June 1921, 1♀ (J. C. Chamberlin, CAS).

### *Cyclosa imias* new species

Figures 49–52; Map 3D

*Holotype.* Female holotype from mountains north of Imias, 3,000–4,000 ft [900 to 1,200 m], Guantánamo Prov., Cuba, 25–28 July 1936 (P. J. Darlington), in MCZ. The specific name is a noun in apposition after the locality.

*Note.* Bryant and Archer determined specimens of this species as *C. caroli*.

*Description.* Female holotype. Carapace light brown. Abdomen venter black with a pair of white spots and some median white spots posteriorly. Abdomen with a minute pair of anterior dorsal tubercles and a median posterior extension (Figs. 51, 52). Total length 3.8 mm. Carapace 1.17 mm long, 0.84 wide in thoracic region, 0.53 wide behind posterior lateral eyes. First femur 0.93 mm, patella and tibia 1.04, metatarsus 0.53, tarsus 0.39. Second patella and tibia 0.98 mm, third 0.57, fourth 0.94. Femora shorter than corresponding patellae and tibiae.

*Variation.* Total length of females 3.8 to 4.2 mm. The illustrations were made from the holotype.

*Diagnosis.* *Cyclosa imias* differs from *C. caroli* by having a narrow scape with a wide depression on each side (Fig. 49).

*Distribution.* Southeastern Cuba (Map 3E).

*Specimens Examined* CUBA *Santiago de Cuba:* Gran Piedra, 29 June 1955, 4♀ (A. F. Archer, AMNH).

### *Cyclosa jalapa* new species

Figures 53–56; Map 3E

*Holotype.* Female holotype from Jalapa, Veracruz, Mexico, July 1981 (C. Gold), in CAS. The specific name is a noun in apposition after the locality.

*Description.* Female holotype. Carapace brown, cephalic region yellow (Fig. 55). Abdomen venter with white, gray and black areas, and a pair of white patches on tubercles. Abdomen sometimes with a pair of indistinct posterior lateral tubercles (Fig. 55). Total length 5.3 mm. Carapace 1.8 mm long, 1.4 wide in thoracic region, 0.8 wide behind posterior lateral eyes. First femur 1.6 mm, patella and tibia 1.8, metatarsus 0.9, tarsus 0.5. Second patella and tibia 1.5 mm, third 0.9, fourth 1.6. Femora shorter than corresponding patellae and tibiae, except for third, which is of same size.

*Variation.* Total length of females 3.9 to 5.3 mm. The illustrations were made from female holotype.

*Diagnosis.* *Cyclosa jalapa* differs from others by the relatively posterior position of the brow and depressions of the epigynum (Fig. 53) and from *C. imias* by the larger posterior median plate (Fig. 54).

*Distribution.* Known only from Veracruz, Mexico (Map 3E); no other specimens have been collected.

### *Cyclosa conigera* F. P.-Cambridge

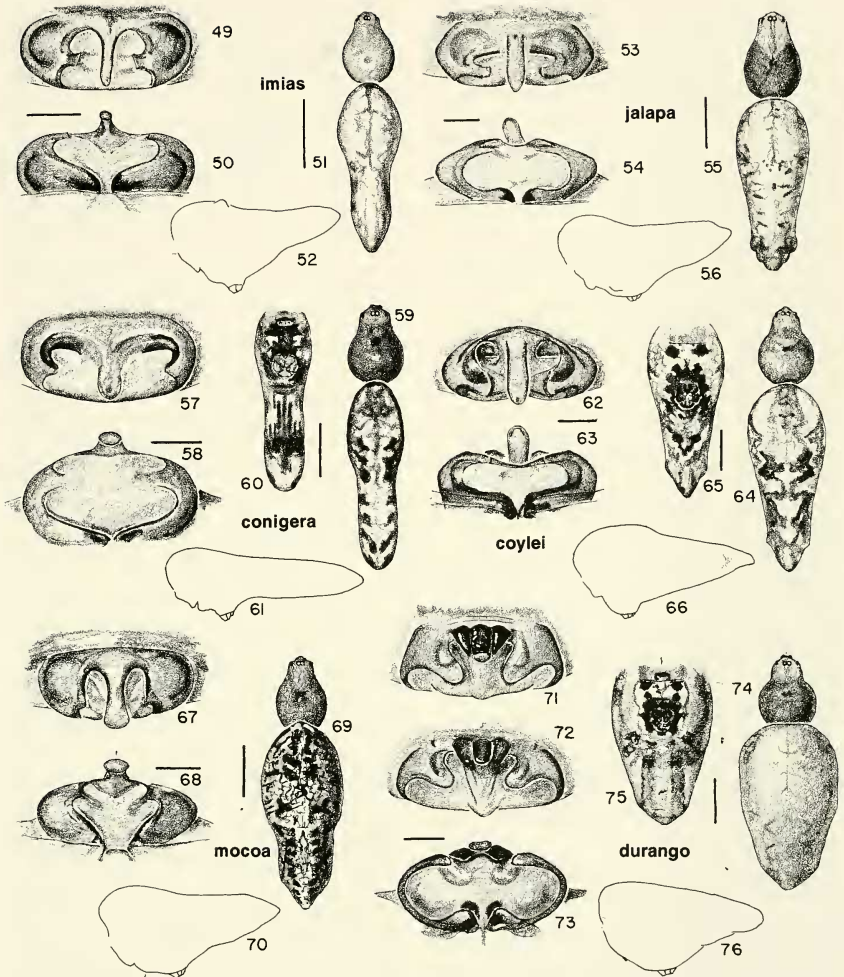
Figures 57–61; Map 3E

*Cyclosa conigera* F. P.-Cambridge, 1904: 494, pl. 47, fig. 5, ♀. Ten female syntypes from Omilteme [Omiltemi, Guerrero, 16 km SW Chilancingo, 17°30'N, 99°40'W (Selander and Vaurie, 1962)].

Figures 49–52. *Cyclosa imias* n. sp., female. 49, 50, epigynum. 49, ventral. 50, posterior. 51, dorsal. 52, abdomen lateral.

Figures 53–56. *C. jalapa* n. sp., female. 53, 54, epigynum. 53, ventral. 54, posterior. 55, dorsal. 56, abdomen lateral.





Figures 57-61. *C. conigera* F. P.-Cambridge, female. 57, 58, epigynum. 57, ventral. 58, posterior. 59, dorsal. 60, abdomen, ventral. 61, abdomen, lateral.

Figures 62-66. *C. coylei* n. sp., female. 62, 63, epigynum. 62, ventral. 63, posterior. 64, dorsal. 65, abdomen, ventral. 66, abdomen, lateral.

Figures 67-70. *C. mocoa* n. sp., female. 67, 68, epigynum. 67, ventral. 68, posterior. 69, dorsal. 70, abdomen lateral.

Figures 71-76. *C. durango* n. sp., female. 71-73, epigynum. 71, ventral. 72, ventroposterior. 73, posterior. 74, dorsal. 75, abdomen, ventral. 76, abdomen, lateral.

Scale lines: 1.0 mm; genitalia 0.1 mm.



Mexico in BMNH, not numbered, examined. Roewer, 1942: 759. Bomet, 1956: 1315.

*Note.* The name *conigera* was erroneously synonymized with *caroli* by Levi (1977).

*Description.* Female syntype. Carapace dark brown, lightest in cephalic region (Fig. 59). Sternum dark brown with ring of connected white patches. Coxae yellowish. Legs yellowish with narrow dark rings. Abdomen venter black and white (Fig. 60). Abdomen pointed posteriorly with an indistinct pair of swellings near posterior end (Figs. 59–61). Total length 6.2 mm. Carapace 1.9 mm long, 1.4 wide in thoracic region, 0.7 wide behind posterior lateral eyes. First femur 1.7 mm, patella and tibia 2.0, metatarsus 1.1, tarsus 0.6. Second patella and tibia 1.7 mm, third 1.0, fourth 1.7. All femora shorter than corresponding patellae and tibiae.

*Variation.* Total length of females 5.4 to 6.2 mm. The illustrations were made from specimens from Mexico.

*Diagnosis.* *Cyclosa conigera* differs from *C. rubronigra* (Fig. 77) by the wider brows and depression of the epigynum (Fig. 57) and from *C. dianasilvae* (Figs. 223, 224) by a smaller posterior median plate (Fig. 58). Also *C. dianasilvae* has a short, wide abdomen (Figs. 225–227), whereas the abdomen of *C. conigera* is slender (Figs. 59–61).

*Natural History.* Specimens have been found in rain forest in Chiapas, Mexico.

*Distribution.* Mexico to Honduras (Map 3E).

*Specimens Examined.* MEXICO. *San Luis Potosí:* Ixtilta [probably Xilitla, Mexico], 2 Dec. 1939, 1♀ (A. M., L. I. Davis, AMNH). *Michoacan:* 1.1 mi E Angahuan, 7,500 ft, 14 Aug. 1967, 1♀ (R. E. Leech, REL). *Chiapas:* Selva del Ocote, 32 km NW Ocozocoatlán, 762 m, 1♀ (C. Mullinex, D. E. Bredlove, CAS). HONDURAS *Atlántida:* Lancetilla, July 1929, 4♀ (A. M. Chickering, MCZ).

### *Cyclosa coylei* new species

Figures 62–66; Map 3E

*Holotype.* Female from 4.1 mi. [6.5 km] W of San Francisco on Route 70, 2,400 m, San Luis Potosí, Mexico, 26 May 1982 (F. Coyle) in MCZ. The spe-

cies is named after the collector and colleague F. Coyle.

*Description.* Female holotype. Carapace dark brown, lightest in cephalic region (Fig. 64). Abdomen venter black and white (Fig. 65). Abdomen pointed with an indistinct pair of humps near posterior end (Fig. 64). Total length 6.6 mm. Carapace 1.9 mm long, 1.4 wide in thoracic region, 0.7 wide behind posterior lateral eyes. First femur 1.7 mm, patella and tibia 2.0, metatarsus 1.1, tarsus 0.6. Second patella and tibia 1.7 mm, third 1.0, fourth 1.7. The third femur the same length as corresponding patella and tibia, other femora shorter.

*Variation.* Total length of females 6.1 to 7.2 mm. The illustrations were made from the female holotype. The Guatemalan specimen has a pair of distinct, posterior lateral humps on the abdomen.

*Diagnosis.* *Cyclosa coylei* is distinguished from other *Cyclosa* species in Mexico and Guatemala by the large wide and deep depressions of the epigynum (Fig. 62) and the relatively short posterior median plate (Fig. 63).

*Natural History.* The Guatemalan specimen was found by beating foliage at a river.

*Distribution.* Mexico, Guatemala (Map 3E).

*Specimens Examined.* MEXICO *Michoacan:* 1.5 km E Angahuan, 2,200 m, 14 Aug. 1967, 1♀ (R. E. Leech, REL); 9.6 km N Cheran, 7–8 July 1985, 1♀ (J. Woolley, G. Zolnerowich, AD, MCZ). GUATEMALA *Jalapa:* Mataquesuintla, El Carrizal, 25 Apr. 1982, 1♀ (S. Fend, DU).

### *Cyclosa mocoa* new species

Figures 67–70; Map 4A

*Holotype.* Female holotype, and one female paratype from between Buenos Aires and El Mirador nr. El Silencia, Pasto to Mocoa Road, east slope of Andes, 2,200 m, Depto. Putumayo, Colombia, 1973 (N. Leighton), in SMNK. The specific name is a noun in apposition after the locality.

*Description.* Female holotype. Carapace dark brown (Fig. 69). Abdomen white with symmetrical, finely dissected dark patches

and lines dorsally, (Fig. 69); venter black with a pair of white patches, each longer than wide. Abdomen with a median posterior extension (Figs. 69, 70). Total length 5.3 mm. Carapace 1.5 mm long, 1.0 wide in thoracic region, 0.6 wide behind posterior lateral eyes. First femur 1.4 mm, patella and tibia 1.5, metatarsus 0.8, tarsus 0.5. Second patella and tibia 1.3 mm, third 0.7, fourth 1.3. Femora shorter than corresponding patellae and tibiae except third, which is of same length.

*Variation.* The paratype has the scape with the sides more parallel than in Figure 67.

*Diagnosis.* *Cyclosa mocoa* differs from other species by the elongate depressions (Fig. 67) and the triangular posterior median plate (Fig. 68) of the epigynum.

*Distribution.* Known only from southern Colombian Andes (Map 4A); no other specimens were found.

#### *Cyclosa durango* new species

Figures 71–76; Map 3D

*Holotype.* Female holotype from 10 mi. (16 km) E of El Salto, Durango, Mexico, 5 Aug. 1947 (W. J. Gertsch), in AMNH. The specific name is a noun in apposition after the locality.

*Description.* Female holotype. Thoracic region of carapace dark brown grading into yellowish cephalic region (Fig. 74). Abdomen venter with black spinneret area and two pairs of black patches on white between this area and genital region (Fig. 75). Abdomen pointed behind, but specimen shrivelled (Figs. 74–76). Total length 6.0 mm. Carapace 1.8 mm long, 1.3 wide in thoracic region, 0.8 wide behind posterior, lateral eyes. First femur 1.8 mm, patella and tibia 2.0, metatarsus 1.1, tarsus 0.6. Second patella and tibia 1.8 mm, third 1.0, fourth 1.7. First femora shorter than corresponding patellae and tibiae, others of same length.

*Note.* This species is puzzling as no others were found with similar, sclerotized, broken epigynum (at 12h in Fig. 71). It is not known whether the dark structures on each side of the epigynum belong to the

spider or are broken conductor teeth left by a male.

*Diagnosis.* No other species were found having a sclerotized scape of the epigynum (Figs. 71, 72), and no others in Mexico with a large posterior median plate (Fig. 73).

*Distribution.* Known only from Durango, Mexico (Map 3D); no other specimens were found.

#### *Cyclosa rubronigra* di Caporiacco

Figures 77–85; Map 4C

*Cyclosa rubronigra* di Caporiacco, 1947: 24. Male holotype from Canaira Road [?Kanaima?] (di Caporiacco, 1948), Guyana, in MZUF, examined. Brignoli, 1983: 266.

*Cyclosa nigrorubra*:—di Caporiacco, 1948: 655, fig. 62, ♂ (error in name).

*Description.* Female from Panama. Carapace dark brown (Fig. 79). Abdomen venter with black and white patches. Abdomen with a median, posterior extension (Figs. 79, 80). Total length 4.4 mm. Carapace 1.5 mm long, 0.9 wide in thoracic region, 0.6 wide behind posterior lateral eyes. First femur 1.2 mm, patella and tibia 1.4, metatarsus 0.8, tarsus 0.5. Second patella and tibia 1.2 mm, third 0.7, fourth 1.3. First two femora shorter than corresponding patellae and tibiae, the third and fourth the same length or slightly longer.

Male from Panama. Coloration darker than in female. Abdomen shorter than in female (Fig. 81). Total length 2.5 mm. Carapace 1.43 mm long, 1.01 wide in thoracic region, 0.39 wide behind posterior lateral eyes. First femur 1.06 mm, patella and tibia 1.19, metatarsus 0.75, tarsus 0.35. Second patella and tibia 1.01 mm, third 0.62, fourth 1.04. First two femora shorter than corresponding patellae and tibiae, others of same length.

*Note.* Two collections had females and males together.

*Variation.* Total length of females 3.5 to 5.2 mm, males 2.1 to 3.8. The illustrations were made from specimens from Barro Colorado Island, Panama.

*Diagnosis.* *Cyclosa rubronigra* has

smaller depressions (Fig. 77) than the more northern *C. conigera* (Fig. 57). The female is distinguished from the similar *C. inca* (Fig. 87) by having a slightly smaller posterior median plate (Fig. 78); the male has a shorter conductor tooth (Fig. 83) than that of *C. inca* (Fig. 94).

*Distribution.* Costa Rica to Rio Grande do Sul, Brazil (Map 4C).

*Specimens Examined.* COSTA RICA *Heredia:* Finca La Selva, Jan. 1978, 1♂ (W. Eberhard, MCZ); Sept., Oct. 1981, 1♂; 1–14 Oct. 1981, 1♂ (C. Griswold, CAS). *Cartago:* Turrialba, 13 Mar. 1967, 1♂ (W. Peck, CAS). *Puntarenas:* Llorona, Parque Nacional Corcovado, Osa Peninsula, 15 Aug. 1978, 1♀ (Y. D. Lubin, MCZ). PANAMA *Panamá:* Barro Colorado Island, 2 Aug., 1♀, 3 imm. (N. Banks, MCZ), 16 June–15 July 1934, 1♂; June 1936, 1♀; July 1936, 1♂; Aug. 1936, 1♂; Aug. 1939, 1♀; Aug. 1954, 1♀ (A. M. Chickering, MCZ); 13 Sept. 1982, 2♀; 23 Sept. 1982, 1♂; 26 Sept. 1982, 2♀; 25 Oct. 1982, 1♀ (C. L. Craig, MCZ); Experimental Gardens, 5 July 1950, 1♂; 12 Aug. 1954, 1♀ (A. M. Chickering, MCZ); Forest Reserve, 25 July 1954, 1♀ (A. M. Chickering, MCZ); Summit, 21–29 July 1950, 1♂ (A. M. Chickering, MCZ); Arraiján, July 1950, 1♂ (A. M. Chickering, MCZ). LESSER ANTILLES *Trinidad:* Arima Valley, Simla Research Sta., 31 Jan. 1984, 1♀, 1♂ (J. Coddington, USNM); Blanchissense Road, St. George, 6 Feb. 1984, 1♀ (J. Coddington, USNM).

VENEZUELA *Bolívar:* 12 km N Neupa, 1,500 m, 1–11 June 1987, 1♂ (S., J. Peck, AMNH). COLOMBIA *Meta:* Carimagua, 100 m, Oct. 1973, 1♀ (W. Eberhard, MCZ). *Valle:* Anchicaya, 400 m, many collections (W. Eberhard 570, MCZ); Cent. Anchicaya, 1♀ (W. Eberhard 845, CAS, MCZ); E. of Buenaventura, 20 Jan. 1970, 1♀ (W. Eberhard 226, MCZ); Cali, 1976, 1♂ (W. Eberhard, MCZ); km 18, road to Cali from Saladito, Sept. 1975, 1♂ (W. Eberhard 977, MCZ); Centr. Hidroelectric, Cali, 1♀ (W. Eberhard, MCZ); N Cisneros, Apr. 1976, 1♀ (W. Eberhard 1055, MCZ); El Silencio, 2,000 m, July 1974, 1♀ (W. Eberhard CES-23, MCZ); NW Guapi, 13 Jan. 1973, 1♀ (W. Eberhard, MCZ); nr. Querrenal, 19 June 1970, 1♀ (W. Eberhard 252, MCZ); Saladito, Sept.

1974, 1♀ (W. Eberhard 28, MCZ); Mar. 1975, 1♀ (W. Eberhard 946, MCZ); Río San Juan afl., del Digma nr. Querrenal, 1,300 m, 1976, 4♀, 1♂ (W. Eberhard 963, MCZ). *Cauca:* Pacific coastal plain, NW of Guapi, Jan. 1973, 1♀ (W. Eberhard, MCZ); 10 km N Piendano, 5,800 m, Feb. 1974, 1♀ (W. Eberhard EG 55, MCZ). *Nariño:* Barbacoa, 20 m, 20 Mar. 1974, 1♀ (W. Eberhard 746, MCZ); Reserva Río Nambi Altaquier, 1,300 m, Oct. 1994, 5♀ (C. Valderrama, CV, MCZ); La Planada, 1,500 m, 7 km S Chocones, July 1986, 1♀, 1♂ (W. Eberhard, MCZ); El Diviso, Aug. 1994, 3♀ (C. Valderrama, CV); La Espriella, 50–60 m, Aug. 1994, 3♀ (C. Valderrama, CV). ECUADOR *Sucumbíos:* Reserva Forestal Cuyabeno, Laguna Grande, 13 Feb. 1989, 1♀ (L. Avilés, MECN). *Pastaza:* Puyo, 18 Apr. 1955, 1♂ (P. W. Hodges, MCZ). PERU *Huánuco:* El Castillo, 2 June 1967, 1♂ (A. F. Archer, S. Risco, AMNH). *Juniún:* Maraynioc, 1♂ (K. Jelski, PAN). *Madre de Dios:* Zona Reservada de Manu, Puesta de Vigilancia Pakitza, 24 Sept.–10 Oct. 1987, 1♂ (J. Coddington, USNM). BRAZIL *Pará:* Belém, 12 Feb. 1959, 1♂ (A. M. Nadler, AMNH). *Amazonas:* Reserva Cabo Frio, 80 km N Manaus, 1959–1992, 1♀ (H. G. Fowler, MCZ); Manans, Reserva Ducke, 23 Feb. 1982, 1♂ (A. A. Lise, MCP 2566). *Goiás:* Goiânia, banks of Rio Meia Ponte, 18 June 1942, 1♀ (F. Lane, MZSP 725S). *Mato Grosso:* Sinop, Oct. 1976, 1♂ (M. Alvarenga, AMNH). *Rio Grande do Sul:* Viamão, 12 Aug. 1994, 1♀ (A. A. Lise, MCP 5277).

### *Cyclosa inca* new species Figures 86–95; Map 4A

*Holotype.* Male holotype, female allotype, from Dantas, SW of Puerto Inca, 270 m, 09°35'S, 75°00'W, Huánuco, Peru, 18 May–1 June 1987 (D. Silva), in MUSM. The specific name is a noun in apposition after the locality.

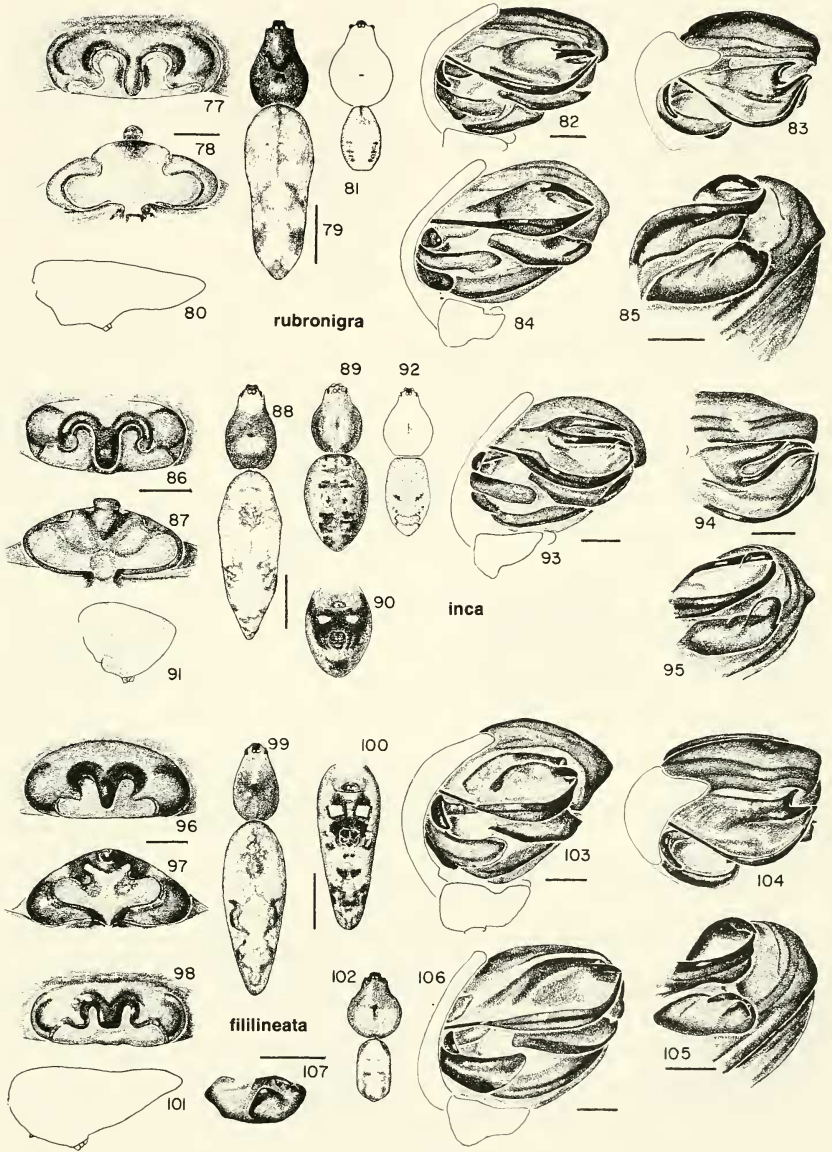
*Description.* Female holotype. Carapace yellowish, gray on each side of thorax (Figs. 88, 89). Sternum yellow, gray on margin. Abdomen venter black with a pair of white patches (Fig. 90). Abdomen with median posterior extension, without dorsal tubercles (Figs. 88–90). Total length 3.3

Figures 77–85. *Cyclosa rubronigra* of Caporiacco. 77–80, female. 77, 78, epigynum. 77, ventral. 78, posterior. 79, dorsal. 80, abdomen, lateral. 81–85, male. 81, dorsal. 82–85, left palpus. 82, 84, mesal. 83, apical. 85, median apophysis. 82–83, 85, (Panama). 84, (near Manaus, Brazil).

Figures 86–95. *C. inca* n. sp. 86–91, female. 86, 87, epigynum. 86, ventral. 87, posterior. 88, 89, dorsal. 90, abdomen, ventral. 91, abdomen, lateral. 92–95, male. 92, dorsal. 93–95, palpus. 93, mesal. 94, apical. 95, median apophysis.

Figures 96–107. *C. fillineata* Hingston. 96–101, female. 96–98, epigynum. 96, ventral. 97, posterior. 98, ventral, broken embolus? (Paraná, Brazil). 99, dorsal. 100, abdomen, ventral. 101, abdomen, lateral. 102–107, male. 102, dorsal. 103–107, palpus. 103, 106, mesal. 104, apical. 105, 107, median apophysis. 103–105, 107, (Panama). 106, (Northern Venezuela).

Scale lines: 1.0 mm; genitalia 0.1 mm.





mm. Carapace 1.37 mm long, 0.95 wide in thoracic region, 0.42 wide behind posterior lateral eyes. First femur 1.10 mm, patella and tibia 1.43, metatarsus 0.78, tarsus 0.41. Second patella and tibia 1.25 mm, third 0.73, fourth 1.17. Femora shorter than corresponding patellae and tibiae, except for third, which is slightly longer.

Male allotype. Carapace dark brown. Sternum brown with darker border. Abdomen gray with black and white spots (Fig. 92), venter black with one pair of white patches. Abdomen as in female (Fig. 92). Total length 2.8 mm. Carapace 1.43 mm long, 0.99 wide in thoracic region, 0.38 wide behind posterior lateral eyes. First femur 1.20 mm, patella and tibia 1.30, metatarsus 0.75, tarsus 0.47. Second patella and tibia 1.01 mm, third 0.57, fourth 1.07. Femora shorter than corresponding patellae and tibiae, except third slightly longer.

*Note.* Males and females were collected together.

*Variation.* The carapace is of variable coloration, yellow, brown, or yellow with brown marks. The scape of the epigynum is of variable width. Total length of females 3.3 to 5.5 mm, males 2.5 to 2.8. All illustrations were made from specimens from Puerto Inca, Huánuco, Peru.

*Diagnosis.* The female of *Cyclosa inca* differs from that of *C. rubronigra* (Fig. 78) by having a larger posterior median plate (Fig. 87). The male has a relatively longer conductor tooth (Figs. 93, 94), almost half the length of the bulb, while that of *C. rubronigra* (Figs. 82–84) is about a quarter

the length of the bulb. Females from Depto. Valle, Colombia are difficult to separate from *C. rubronigra*.

*Natural History.* Specimens have been collected by fogging canopy in Tambopata, Peru, and from vegetation in Colombia.

*Distribution.* Upper Amazon of Colombia and Ecuador, south to Rio Grande do Sul Brazil and Misiones Province, Argentina (Map 4A).

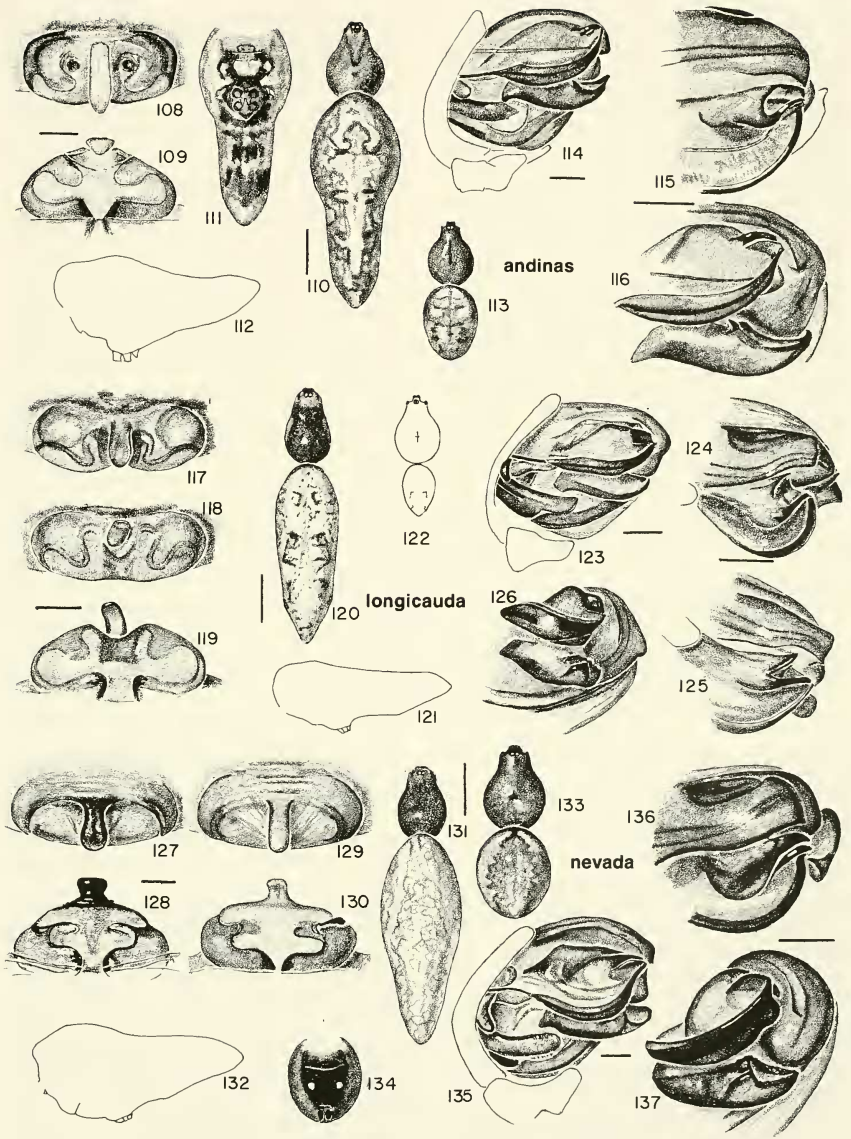
*Specimens Examined.* COLOMBIA Amazonas: Acaeracena, 270 m, 1♀ (C. Valderrama, CV). EC-UADOR Sucumbios: Reserva Forestal Cuyabeno, July 1989, 2♀ (G. Estévez, MECN). Imbabura: Las Cedros Biol Sta., 1,300–1,450 m, 1♀ (D. Dempsey, MCZ). Pichincha: Santo Domingo, 22 Aug. 1992, 1♂ (D. Fitzpatrick, W. Piel, MECN). PERU Loreto: Jenaro Herrera, 04°45'S, 78°45'W, 26 Aug. 1988, 6♀ (D. Silva, MUSM); Pithecia, 05°11'S, 72°42'W, 14 Aug. 1989, 1♀, 1♂ (D. Silva, MUSM); Río Samiria, 04°43'S, 74°18'W, 31 May 1990, 1♀ (D. Silva, MUSM); Boca del Río Samiria, 04°39'S, 74°21'N, 11 Aug. 1989, 1♀ (D. Silva, MUSM); Cocha Shinguito, 05°08'S, 74°45'W, 7♀ (T. Ervin, D. Silva, MUSM); May 1990, 1♂ (D. Silva, MUSM). Amazonas: Alto Río Comaima, Puesto de Vigilancia Paquisha, 850–1,150 m, 21 Oct–3 Nov. 1987, 6♀, 3♂ (D. Silva, MUSM, MCZ); Montenegro, Bagna, 350 m, 29 Sept., 1 Oct. 1963, 1♂ (Herrer, P. Wygodzinsky, AMNH). Ucayali: Bosque Nacional A. von Humboldt, Pucallpa, 29 July 1986, 1♀ (D. Silva, MUSM). Huánuco: Cucharas, Huallaga Valley, Feb. Apr. 1954, 3♂ (F. Woytkowski, CAS); Cueva de las Lechuzas, Tingo María, 31 May 1967, 3♀ (A. F. Archer, AMNH); Dantas la Molina, SW de Puerto Inca, 09°38'S, 75°00'W, 18 May–1 June 1987, 5♀, 1♂ (D. Silva, MUSM); Monson Valley, Tingo María, 23 Sept. 1954, 1♀ (E. I. Schlinger, E. S. Ross, CAS). Pasco: 2 km La Suiza, Chantabamba, 23 June 1986, 1♂ (D. Silva, MUSM); Hnancabamba, Quebrada Chispa, NW Iscozacin, 10°10'S, 75°15'W, 26–30 Oct. 1986, 1♀, 1♂ (D. Silva, MUSM). Junín: Utenyuacu, 1,600–2,200 m, Mar. 1948, 1♂ (F. Woytkowski, AMNH). *Madre de*

Figures 108–116. *Cyclosa andinas* n. sp. 108–112, female. 108, 109, epigynum. 108, ventral. 109, posterior. 110, dorsal. 111, abdomen, ventral. 112, abdomen, lateral. 113–116, male. 113, dorsal. 114–116, left palpus. 114, mesal. 115, apical. 116, median apophysis.

Figures 117–126. *C. longicauda* (Taczanowski). 117–121, female. 117–119, epigynum. 117, ventral. 118, ventroposterior. 119, posterior. 120, dorsal. 121, abdomen, lateral. 122–125, male. 122, dorsal. 123–126, left palpus. 123, mesal. 125, apical. 126, median apophysis.

Figures 127–137. *C. nevada* n. sp. 127–132, female. 127–130, epigynum (from same coll.). 127, 129, ventral. 128, 130, posterior. 131, dorsal. 132, abdomen, lateral. 133–137, male. 133, dorsal. 134, abdomen, ventral. 135–137, palpus. 135, mesal. 136, apical. 137, median apophysis.

Scale lines: 1.0 mm; genitalia 0.1 mm.





*Dios*: Atalaya, 23 Sept. 1989, 1♂ (D. Silva, MUSM); 13–15 km E Puerto Maldonado, 12°33'S, 69°03'W, 9, 10 June 1989, 1♀, 1♂; 18 July 1989, 1♂ (D. Silva, MUSM); 23 June 1989, 1♀ (D. Silva, MUSM); 9 July 1989, 2♀ (D. Silva, MUSM); Zona Reservada Manu, Pakitza, numerous records (MUSM, USNM); Zona Reservada Tambopata, numerous records (MUSM, USNM); Tambopata Explorer's Inn, 30 Mar. 1988, 1♀ (J. Palmer, D. Smith, MCZ). BRAZIL *Amazonas*: Colosso Reserve, 50 km N Manaus, 1989–1991, numerous collections, ♀ (H. Fowler, E. Venticinque, R. S. Vieira, MCZ); Dimona Reserve, 1989–1992, 1♀ (H. Fowler, MCZ); Km 41 Reserve, 80 km N Manaus, 18 Apr. 1991, 2♀ (H. Fowler, E. Venticinque, R. S. Vieira, MCZ); Porto Alegre, 80 km N Manaus, 1989–1992, 1♀ (H. Fowler, MCZ); Cabo Frio Reserve, 1989–1993, 1♂ (H. G. Fowler, MCZ); Parque Nacional do Pico Neblina, Maturacá, 13 Oct. 1990, 1♀ (A. A. Lise, MCP); *Rio Grande do Sul*: Montenegro, 11 Aug. 1977, 2♀, 7 imm. (A. A. Lise, MCN 6255). BOLIVIA *La Paz*: Sepecho [?], 30 July 1993, 1♀ (A. Brescovit, M. Höfer, SMNK 1366) *Beni*: Estación Biolo, Beni, 9 Sept. 1987, 1♀ (S. Larcher, USNM); 24, 25 July 1993, 2♀ (A. Brescovit, MCN 24120, SMNK 1370). PARAGUAY *Alto Paraná*: Puerto Stroessner [Cindad del Este], CFAP, Parcelle iv, Monte Natural, 10 Mar. 1983, 1♂ (C. Drouhy, MHNG). ARGENTINA *Misiones*: Parque Nacional Iguazú, Jan. 1966, 1♂ (M. E. Galiano, MECN).

*Cyclosa fillineata* Hingston  
Figures 96–107; Map 4B

*Cyclosa sericaria* Simon, 1895: 752. Nomen nudum.  
*Cyclosa fillineata* Hingston, 1932: 116, 371. Female from Essequibo River, Guyana, in BMNH, lost. Female neotype, here designated, with imm. male from Santarém, Est. Pará, Brazil, 25 Jan. 1994 (A. D. Brescovit) in MCN no. 25340. Roewer, 1942: 759. Bonnet, 1956: 1316.  
*Cyclosa filisinuosa* Hingston, 1932: 114, 372. Male from Essequibo River, Guyana, in BMNH, lost. Roewer, 1942: 759. Bonnet, 1956: 1316. NEW SYNONYMY.

*Note.* *Cyclosa sericaria* is cited by Simon from San Esteban, Est. Carabobo, Venezuela; a specimen is in the MNHN, but no description could be found.

Hingston describes *C. fillineata* with the abdomen oval, no shoulder humps, posterior end pointed, without tubercles, total length 2.7 mm; *C. filisinuosa* total length 1.5 mm. Both of Hingston's specimens may have been immature.

*Description.* Female from Santarém, Pará, Brazil, MCN 25340. Carapace brown, cephalic region yellow (Fig. 99).

Abdomen venter black with a large pair of symmetrical white patches (Fig. 100). Abdomen with narrow, posterior extension (Fig. 99), but without dorsal tubercles. Total length 4.7 mm. Carapace 1.43 mm long, 0.91 wide in thoracic region, 0.49 wide behind posterior lateral eyes. First femur 1.11 mm, patella and tibia 1.38, metatarsus 0.78, tarsus 0.45. Second patella and tibia 0.79 mm, third 0.72, fourth 1.18. All femora shorter than corresponding patellae and tibiae.

Male from Santarém, Pará, Brazil, MCN 25295. Carapace much darker than in female, thorax having a light brown transverse area (Fig. 102). Abdomen light with some dark marks, venter black without white patches. Abdomen relatively wide posteriorly (Fig. 102). Total length 2.4 mm. Carapace 1.35 mm long, 1.00 wide in thoracic region, 0.37 wide behind posterior lateral eyes. First femur 1.00 mm, patella and tibia 1.13, metatarsus 0.72, tarsus 0.39. Second patella and tibia 0.95 mm, third 0.48, fourth 0.93. First two femora shorter than corresponding patellae and tibiae, third longer, fourth of same length.

*Note.* Males and females were collected together.

*Variation.* Total length of females 3.4 to 5.2 mm, most less than 5 mm; males 2.1 to 2.9. Figures 96, 97, 99–101 illustrate the female neotype; Figure 98 from Ilha Guarani, Paraná, Brazil; Figures 102–104, 107 from Ilha Arvoredo, Santa Catarina, Brazil; Figures 105, 106 from Aragua, Venezuela.

*Diagnosis.* The epigynum (Fig. 96) has depressions slightly smaller than those of *C. rubronigra* (Fig. 77) and *C. inca* (Fig. 86) and has a much smaller posterior median plate (Fig. 97) than in *C. rubronigra* (Fig. 78) and *C. inca* (Fig. 87). The palpus differs from these two species by having a smaller, wider conductor tooth (Figs. 103, 106) and the median apophysis with an asymmetrical lobe (Figs. 105, 107).

*Natural History.* This species is smaller than most species of *Cyclosa*. Specimens

have been collected by fogging canopy in Tambopata, Peru; from rainforest at Explorama Inn, Iquitos, Peru; in forest in Belém; and in gallery forest in northern Mato Grosso.

**Distribution.** Widespread from Panama to northern Argentina (Map 4B).

**Specimens Examined.** PANAMA *Panamá*: Cerro Galero, ♂ (MCZ). LESSER ANTILLES *Trinidad*: Arima Ward, Blanchisseuse Road, ♀ (USNM). VENEZUELA *Aragua*: Rancho Grande, Henri Pittier National Park, 750 m, ♂ (USNM). *Merida*: Merida road to Azulita, La Carbonero, ♀ (MCZ). GUYANA *Isherton* [?], ♀ (AMNH). FRENCH GUIANA *Cayenne*, ♂ (AMNH). COLOMBIA *Amazonas*: 48 km NW Leticia, Amacayaen Parque Nacional, ♀ (MCZ); Río Pira and Apaporis, 0°25'S, 70°15'W, ♀ (CAS). ECUADOR *Sucumbios*: Reserva Forestal Cuyabeno, ♀ (G. Estévez, MECN). *Napo*: Misuaguallí, Oriente [Misahuallí], ♀ (AMNH). PERU *Loreto*: Explorama Inn, 240 km NE Iquitos, ♀ (FSCA); Jenaro Herrera, 04°45'S, 73°45'W, ♀ (MUSM); Cocha Shinguito, 05°08'S, 74°45'W, ♀ ♂ (MUSM); Pebas [and São Paulo de Olivença], ♀ (MNHN 40956). *Ucayali*: Bosque Nacional A. von Humboldt, nr. Pucallpa, ♀ (MUSM). *Huánuco*: Dantas, ♀ ♂ (USNM, MUSM); Monson Valley, Tingo María, ♀ ♂ (CAS); Tingo María, ♀ (AMNH). *Pasco*: Quebrada Castilla, 10°10'S, 75°15'W, ♀ (MUSM). *Madre de Dios*: Zona Reservada Pakitza, ♀ (MUSM); ♀ (MUSM); 15 km E Puerto Maldonado, ♀ (MUSM). BRAZIL *Pará*: Alter do Chão, Santarém, ♀ (MCN 25321); Belém, ♀ ♂ (MACN); ♀ (MCZ); Fazenda Velha, Belém, ♀ ♂ (MACN); Santarém, Alter do Chão, ♂ (MCN 25295, SMNK); ♀ (MCN 25048, 25584). *Roraima*: Maracá, ♂ (INPA); ♀ (INPA); ♀ ♂ (INPA); Ilha de Maracá, ♂ (INPA); ♀ ♂ (MCN 27077, 27080); Rio Uraicoera, ♂ (MCN 27079); ♂ (MCN 27078); ♀ (MCN 27073); ♂ (MCN 27076); ♀ ♂ (MCP 1884); Ilha de Ularacá, ♂ (INPA); Ularacá, ♀ (INPA). *Amazonas*: Colosso Reserve, ♀ ♂ (MCZ); Km 41 Reserve, ♀ (MCZ); Manaus, ♀ (MCZ); Manaus, Reserva Duke, ♀ ♂ (INPA, MCN 27074, 27075); ♂ (MCN 21406); Tarumã Mirim, flooded forest area nr. Manaus, ♀ (INPA); [Pebas] and São Paulo Olivença, ♀ (MNHN 40956). *Pernambuco*: Pernambuco, ♂ (SMF). *Mato Grosso*: Barra do Tapirape, ♂ (AMNH); Chapada dos Guimarães, ♀ (MCP 2363, 2167); Chavantina, 1 ♀ (MZSP 4640); ♀ (MZSP 1202); Poconé, Pantanal, ♂ (MCP 2430); Porto Cereado, ♂ (MCP 2607); Sta. Antonio de Levergere, ♂ (MCZ). *Mato Grosso do Sul*: 30 km de Miranda, Pantanal, ♀ (MCN 25670). *Rio de Janeiro*: Rio de Janeiro, ♀ (MNHN 8509); Teresópolis, 900–1,000 m, ♀ (AMNH); Sumaré, Rio de Janeiro, ♀ (AMNH). *São Paulo*: Amparo, ♀ (MZSP 4635); nr. Botucatu, ♀ (MCZ); Botucatu Vitoriana, Fazenda Edgardia, ♀ (I. M. P. Rinaldi, IMPR); Botucatu, Rubias Junior, ♀ (IMPR); Itu, ♂ (MZSP 9592); Jequir-

ituba, Cidade São Paulo, ♀ (AMNH); Nova Europa, ♀ (MZSP 4335); Fóz do Iguaçu, ♀ (MCN 23491); Rio Clara, ♂ (MZSP 9664); São Roque, ♂ (MZSP 13155); São Sebastião, Barra do Una, ♀ (MZSP 9532). *Paraná*: Almirante Tamandaré, ♂ (MCN 12507); Colombo, ♂ (MCN 20577); Parque Nacional do Iguaçu, Fóz do Iguaçu, ♀ ♂ (MCN 23345, 23531); Salto Casias Rio Iguaçu, ♀ (MCZ); ♂ (MCN 23433); Parque Nacional do Iguaçu, Capitão Leonidas Marques, ♀ (MCN 23295); Refúgio Biológico de Bela Vista, Foz de Iguaçu, ♀ ♂ (MCN 20879); ♀ (MCN 21640); Serra da Graciosa, Morretes, ♀ (MCP 7171); Rancho Queimado [?], ♀ (MCN 25834); Três Barras do Paraná, Rio Guarani, ♀ ♂ (MCN 22999). *Santa Catarina*: Res. Biológica Arvoredo, ♀ (MCP 7474); Ilha de Arvoredo, ♀ ♂ (MCP 4052); Estrada Concorórdia, 27°11'S, 52°10'W, ♀ (MCN 27241). *Rio Grande do Sul*: Almirante Tamandaré, ♂ (MCN 12405); General Câmara, ♂ (MCN 10734); Irai, ♀ (MCN 3131); Linha Alegre, Arroio do Meio, ♂ (MCN 12902); Machadinho, ♂ (MCN 15935); Montenegro, ♂ (MCN 6239); Parque Florestal Estadual de Nonoi, ♀ (MCN 12814); Paço de Carvão, Campo Bom, ♂ (MCN 9368); Barra do Ouro, Osório, ♂ (MCN 12765); Tenente Portela, ♀ (MCN 8969a); Santa Maria, ♂ (MCN 15301); Santa Maria, Três Barras, ♂ (MCP 4636); Viamão, ♀ (MCP 4671). PARAGUAY *Concepción*: Apo, ♀ (AMNH). *Paraguari*: Ybycuil Natl. Park, ♀ (MCZ). *Alto Paraná*: Taguara-zapa, ♀ ♂ (AMNH). BOLIVIA *La Paz*: Sapecho, Alto Beni, ♀ (MCN 24076). *Beni*: Mamuré "Geb" [Gebiet, Gebirge, area, mountains?], northern Bolivia, ♀ (SMF); Estação Biol. de Beni, ♀ ♂ (USNM); ♀ (USNM); ♀ (MCN 24129). ARGENTINA *Misiones*: Santa María, ♀ (MACN); Parque Nacional Iguazú, ♀ (MACN); 30 km Puerto Bemberg [Puerto Libertad], Río Uruguay-í, ♀ (MACN 3165). *Chaco*: Rio de Oro, ♀ (MACN).

### *Cyclosa andinas* new species Figures 108–116; Map 3B

**Holotype.** Female holotype, male allotype, five female and two male paratypes and eight immatures from near Habana, 2,200 m elev., on dead end road east of Palmira, Valle, Colombia, 16 Sept. 1969 (W. Eberhard), in MCZ. The specific name is an arbitrary combination of letters.

**Description.** Female holotype. Carapace dark brown (Fig. 110). Abdomen with fine black markings (Fig. 110), venter black and white with three white patches in a row between epigynum and spinnerets (Fig. 111). Abdomen narrow pear-shaped (Fig. 112). Total length 5.7 mm. Carapace 1.7 mm long, 1.2 wide in thoracic region, 0.7 wide behind posterior lateral eyes. First femur 1.6 mm, patella and tibia 1.9,

metatarsus 0.9, tarsus 0.5. Second patella and tibia 1.7 mm, third 0.7, fourth 1.5. Femora shorter than corresponding patellae and tibiae, except third, which is longer.

Male allotype. Carapace dark brown. Abdomen black on each side anteriorly (Fig. 113); venter black with with a pair of distinct white spots. Abdomen drop-shaped (Fig. 113). Total length 3.3 mm. Carapace 1.52 mm long, 1.12 wide in thoracic region, 0.51 wide behind posterior lateral eyes. First femur 1.44 mm, patella and tibia 1.46, metatarsus 0.78, tarsus 0.44. Second patella and tibia 1.20 mm, third 0.68, fourth 1.12. Second to fourth femora slightly longer than corresponding patella and tibia.

*Note.* Males and females were collected together. This species may be social.

*Variation.* Total length of females 5.7 to 7.0 mm, males 2.8 to 3.7. The illustrations (Figs. 108–116) were made from female holotype and male allotype.

*Diagnosis.* The shape of the abdomen (Figs. 110–112) separates *C. andinas* from *C. walckenaeri* (Figs. 337, 338). The narrow scape and deep depressions of the epigynum (Figs. 108, 109) separate the female, and the long, narrow conductor tooth and barb of the median apophysis (Fig. 116) separate the male from similar species.

*Natural History.* This species lives at high elevation, 2,200–2,400 m elevation, and the collector referred to them as an aggregate.

*Distribution.* Southern Colombian and northern Ecuadoran Andes (Map. 3B).

*Paratypes.* Three females and 12 immatures from roadside from type locality.

*Specimens Examined.* COLOMBIA Marcopampa [?], 2,400 m, 10 Nov. 1973, 7♀, 2♂ (K. Leist, SMNK). Huila: 12 km E Santa Leticia [2°20'N, 76°14'W], 2,300 m, Mar. 1976, 1♂ (W. Eberhard, MCZ). Putumayo: east slope of Andes, Pasto-Mococa Road, between Buenos Aires and El Mirador near Silencio, 1973, 1♀ (K. Leist, SMNK). ECUADOR *Pichincha*: Santo Domingo Road, Quito, 2,500 m, 25 Apr. 1942, 1♀, 3♂ (H. F. Haight, CAS).

*Cyclosa longicauda* (Taczanowski),  
new combination  
Figures 117–126; Map 3A

*Singa longicauda* Taczanowski, 1878: 145. Female holotype from Amable María [Río Tulumayo valley, W of Tulumayo, ca. 10 km S of San Ramón, 11°10'S, 75°19'W, Depto. Junín (Stephens and Traylor, 1983)], Peru in PAN, examined. Roever, 1942: 877.

*Araucus longicaudus*:—Bonnet, 1955: 530.

*Description.* Female from Quebrada Chispa. Carapace brown, eye region lightest and a yellow band on each anterior margin of thoracic region (Fig. 120). Abdomen white, only lightly marked dorsally with black lines and spots (Fig. 120); venter black with indistinct white patches. Abdomen with a median posterior extension (Fig. 121); the extension of the abdomen from the spinnerets to the posterior tip is twice as long as the abdomen anterior to the median spinnerets (Fig. 121). Total length 5.6 mm. Carapace 1.6 mm long, 1.1 wide in thoracic region, 0.6 wide behind posterior lateral eyes. First femur 1.4 mm, patella and tibia 1.7, metatarsus 0.9, tarsus 0.6. Second patella and tibia 1.5 mm, third 0.9, fourth 1.5. Femora shorter than corresponding patellae and tibiae, except third, in which it is same length.

Male from Quebrada Chispa. Carapace dark brown. Total length 2.5 mm. Carapace 1.34 mm long, 0.91 wide in thoracic region, 0.39 wide behind posterior lateral eyes. First femur 1.13 mm, patella and tibia 1.18, metatarsus 0.72, tarsus 0.40. Second patella and tibia 0.92 mm, third 0.54, fourth 1.04. Length of first and fourth femora shorter than corresponding patellae and tibiae, second same length, third longer.

*Note* A male and female were collected together at Quebrada Chispa. One female from Ecuador was collected with a male of *C. inca*.

*Variation.* Total length of females 3.8 to 5.8 mm. The epigyna with the widest scapes came from Bolivia. The illustrations were made from female and males from Depto. Pasco, Peru.

**Diagnosis.** Females differ from all other *Cyclosa* without dorsal tubercles on the abdomen (Fig. 121) by having a deep groove underneath the scape of the epigynum (Figs. 117–119). The groove can be seen in posterior view by the median dent along the upper margin underneath the scape (Fig. 119). In subventral view a dark V-shaped mark is visible behind the scape (Fig. 118). The male differs from others by the short, wide, parrot beak-shaped conductor tooth and the asymmetrical median apophysis lobe (Fig. 126).

**Distribution.** Amazon area, western Colombia, Peru to Misiones Prov., Argentina (Map 3A).

**Natural History.** Specimens have been collected at night and in a low mudflat, Beni Biol. Station, Bolivia.

**Specimens Examined.** COLOMBIA *Valle*: 18 km E of Buenaventura, 50 m, 20 Jan. 1970, 1♀ (W. Eberhard, MCZ); nr. Cali, 1,000 m, 1♀ (W. Eberhard E-58, MCZ). ECUADOR *Pichincha*: Santo Domingo, 0°15'S, 79°09'W, 22 Aug. 1992, 1♀ (D. Fitzpatrick, W. Piel, MECN). PERU *Loreto*: Cocha Shinquito, 05°08'S, 74°45'W, 27 June 1990, 7♀ (T. Erwin, D. Silva, MUSM); Pithhecia, 05°11'S, 72°42'W, 14 Aug. 1989, 1♀ (D. Silva, MUSM). *Amazonas*: Alto Río Coimaina, Puesto de Vigilancia Falso Paquisha, 21 Oct–3 Nov. 1987, 2♀ (D. Silva, MUSM). *Ucayali*: Bosque Nacional A. von Humboldt, 30 July 1986, 1♀ (D. Silva, MUSM). *Huánuco*: Dantas la Molina, SW of Puerto Inca, 18 May–1 June 1987, 3♀ (D. Silva, MUSM). *Pasco*: Huancabamba, Quebrada Chispa, NW de Isozacain, 345 m, 10°10'S, 75°15'W, 26–30 Oct. 1986, 3♀, 2♂ (D. Silva, MUSM); Quebrada Castilla, NW de Isozacain, 13 Oct. 1987, 2♀ (D. Silva MUSM); Oxapampa, 22 June 1986, 1♀ (D. Silva, MUSM). *Madre de Dios*: 15 km E Puerto Maldonado, 1 June 1989, 1♀ (D. Silva, MUSM); Zona Reservada Pakitza, 27 Sept. 1987, 1♀ (J. Coddington, D. Silva, MUSM); 1–4 Oct. 1987, 2♀ (D. Silva et al., USNM); 9 May 1991, 1♀ (D. Silva, MUSM); 10–19 Oct. 1991, 1♀ (D. Silva et al., USNM); Zona Reservada Tambopata, 1987–1988, 4♀ (D. Silva, MUSM); Explorers Inn, 30 Mar. 1988, 1♀ (J. Palmer, D. Smith, MCZ). BOLIVIA *Beni*: Estacion Biol. Beni, 27 km SW Yucomo, 17 Sept. 1987, 1♀ (W. E. Steiner et al., USNM); 12 Nov. 1987, 1♀ (W. E. Steiner et al., USNM); 15–19 Nov. 1989, 1♀ (J. Coddington et al., USNM); 27 km SW Tucuma, 15–19 Nov. 1989, 3♀ (J. Coddington et al., USNM). BRAZIL *Amazonas*: Km 41 Reserve, 80 km N Manaus, 1889–1992, 1♀ (H. Fowler, MCN); Cabo Frio Reserve, 80 km N Manaus, 7 Feb. 1990, 1♀ (H. Fowler, E. Venticinque, R. S. Vieira, MCZ). *Paraná*: Parque Nacional de Ig-

uaçu, Foz de Iguaçu, 29. 30 Mar. 1994, 1♀ (A. B. Bonaldo, MCN 23491a). ARGENTINA *Misiones*: Parque Nacional Iguazú, Sendero Macuco, 6 Oct. 1993, 1♀ (M. Di Vitteti, MACN).

### *Cyclosa nevada* new species Figures 127–137; Map 3A

**Holotype.** Female holotype, male allotype, and 14 female and 18 male paratypes from San Lorenzo, Sierra Nevada de Santa Marta, Depto. Magdalena, 2,200 m, in front of building of the nature protection department, Inderana, 18–25 Aug. 1985, Colombia (H.-G. Müller), in SMF. The specific name is a noun in apposition after the locality.

**Description.** Female holotype. Carapace dark brown, eye region lightest (Fig. 131). Abdomen white with irregular lines and indications of a pair of white bands (Fig. 131); venter with white patches between epigynum and spinnerets. Abdomen with median posterior extension (Fig. 132). Total length 5.8 mm. Carapace 1.3 mm long, 1.0 wide in thoracic region, 0.6 wide behind posterior lateral eyes. First femur 1.2 mm, patella and tibia 1.5, metatarsus 0.7, tarsus 0.6. Second patella and tibia 1.3 mm, third 0.7, fourth 1.2. Femora shorter than corresponding patellae and tibiae, except third, which is the same.

Male allotype. Coloration as in female, except eye region dark brown. Abdomen with faint indication of a folium (Fig. 133). Abdomen oval with a posterior median tubercle (Fig. 133). Abdomen oval with a posterior median tubercle (Fig. 133). Total length 3.1 mm. Carapace 1.56 mm long, 1.21 wide in thoracic region, 0.52 wide behind posterior lateral eyes. First femur 1.44 mm, patella and tibia 1.66, metatarsus 0.88, tarsus 0.46. Second patella and tibia 1.30 mm, third 0.74, fourth 1.12. Length of femora shorter than corresponding patellae and tibiae, except third, which is longer.

**Note.** Males and females were collected together.

**Variation.** Total length of females 4.6 to 6.8 mm, males 2.9 to 3.3. No two specimens have the same length, width or shape of the scape (Figs. 127, 129). The



illustrations were made from holotype and allotype.

**Diagnosis.** Females are separated by the narrow lateral plates of the epigynum in ventral view (Figs. 127, 129), and the small posterior median plate (Figs. 128, 130); males differ from all other species by the shape of the rows of denticles on the median apophysis (Fig. 137).

**Natural History.** Females were collected in moist debris and mosses, low growth vegetation, roadside vegetation, pasture with shrubs, and in coniferous forest (*Cupressus* sp.).

**Distribution.** Northern Colombian Sierra Nevada de Santa Marta (Map 3A).

**Specimens Examined.** COLOMBIA *Magdalena*: San Lorenzo, Sierra Nevada de Santa Marta, 2,200 m, 18–25 Aug. 1985, 15♀, 23♂ (H. G. Müller, SMF); 20 Apr. 1986, 1♀ (H. G. Müller, SMF).

#### *Cyclosa pedropalo* new species Figures 138–145; Map 4E

**Holotype.** Female holotype, male allotype and one female, one male paratype from Pedro Palo, 2,000 m elev., Depto. Cundinamarca, Colombia (C. Valderrama), in MCZ, paratypes in ICNB. The specific name is a noun in apposition after the locality.

**Note.** Pedro Palo is a small pond close to a town named La Mesa, 40 to 50 km west of Bogota (C. Valderrama, personal correspondence).

**Description.** Female holotype. Carapace dark brown (Fig. 140). Abdomen venter black with white patches. Abdomen with a posterior extension (Fig. 141). Total length 6.0 mm. Carapace 1.9 mm long, 1.2 wide in thoracic region, 0.8 wide behind posterior lateral eyes. First femur 1.6 mm, patella and tibia 1.9, metatarsus 1.0, tarsus 0.5. Second patella and tibia 1.7 mm, third 1.0, fourth 1.7. Femora shorter than corresponding patellae and tibiae, except third, which is of equal length.

Male allotype. Coloration similar to that

of female, except venter black with pair of white spots. Abdomen as in female (Fig. 142). Total length 4.0 mm. Carapace 1.70 mm long, 1.33 wide in thoracic region, 0.54 wide behind posterior lateral eyes. First femur 1.69 mm, patella and tibia 1.82, metatarsus 0.91, tarsus 0.48. Second patella and tibia 1.43 mm, third 0.80, fourth 1.43. First two femora shorter than corresponding patellae and tibiae, third longer, fourth of equal length.

**Note.** Males and females were collected together.

**Variation.** Total length of females 6.0 to 6.7 mm. The illustrations were made from female holotype and male allotype.

**Diagnosis.** The epigynum is separated from others by the straight lip of the opening (Fig. 138) and the large posterior median plate (Fig. 139). The males have relatively heavy sclerotization of the conductor flap (Figs. 144, 145).

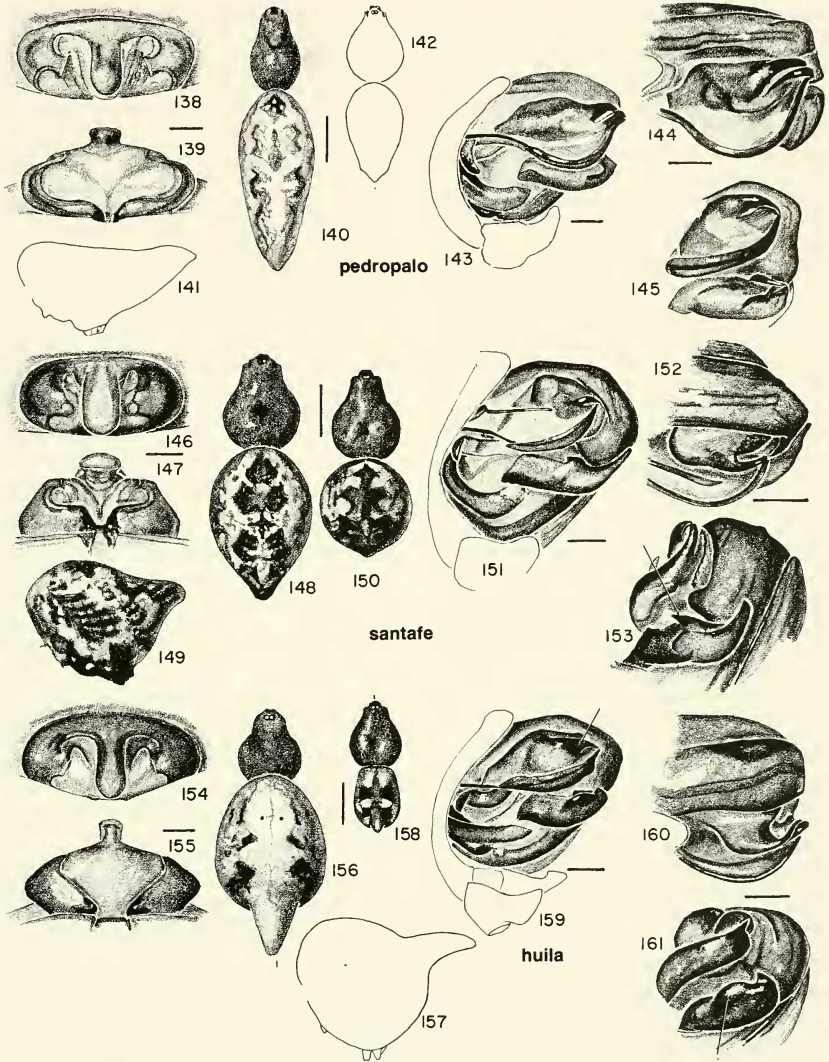
**Distribution.** Colombian Andes (Map 4E).

**Specimens Examined.** COLOMBIA *Putumayo*: El Diviso, Pasto to Mocoa road, E slope Andes, ca. 2,000 m, 3 Dec. 1973, 6♀ (N. Leist, SMNK). *Nariño*: La Ceja, on road W side Volcán Chiles, 30 km from town of Chiles, 2,600 m, June 1995, 2♀ (C. Valderrama, CVC).

#### *Cyclosa santafe* new species Figures 146–153; Map 4D

**Holotype.** Female holotype, male allotype from 16 km W Bogota, Colombia, 10 Mar. 1955 (E. S. Ross, E. I. Schlinger), in CAS. The specific name is a noun in apposition after the full name of the locality, Santa Fé de Bogota.

**Description.** Female holotype. Carapace dark brown (Fig. 148). Abdomen contrastingly marked (Fig. 148); venter black with white patches. Abdomen short with a dorsal posterior extension (Fig. 148). Total length 4.6 mm. Carapace 1.8 mm long, 1.4 wide in thoracic region, 0.8 wide behind



Figures 146-153. *C. santafe* n. sp. 146-149, female. 146, 147, epigynum. 146, ventral. 147, posterior. 148, dorsal. 149, abdomen, lateral. 150-153, male. 150, dorsal. 151-153, palpus. 151, mesal. 152, apical. 153, median apophysis.

Figures 154-161. *C. huila* n. sp. 154-157, female. 154, 155, epigynum. 154, ventral. 155, posterior. 156, dorsal. 157, abdomen, lateral. 158-161, male. 158, dorsal. 159-161, palpus. 159, mesal. 160, apical. 161, median apophysis.

Scale lines: 1.0 mm; genitalia 0.1 mm.



posterior lateral eyes. First femur 1.8 mm, patella and tibia 2.0, metatarsus 1.1, tarsus 0.6. Second patella and tibia 1.7 mm, third 1.1, fourth 1.5. Femora shorter than corresponding patellae and tibiae, except third, which is slightly longer.

Male allotype. Coloration much darker than in female, with little white pigment. Dorsum of abdomen with a pair of white streaks anteriorly (Fig. 150), venter with two white spots. Total length 3.9 mm. Carapace 1.7 mm long, 1.3 wide in thoracic region, 0.6 wide behind posterior lateral eyes. First femur 1.5 mm, patella and tibia 1.7, metatarsus 1.0, tarsus 0.5. Second patella and tibia 1.4 mm, third 0.9, fourth 1.5. Length of femora shorter than adjacent patellae and tibiae, except third, which is of equal length.

*Note.* Males and females were collected together.

*Diagnosis.* The short body distinguishes this species from other *Cyclosa* without dorsal tubercles, as does the epigynum with its opening having round sides (Fig. 146) and a small posterior median plate (Fig. 147). The palpus has a narrow conductor tooth and a large barb on the median apophysis (arrow in Fig. 153).

*Distribution.* Known only from near Bogotá, Colombia; no other specimens were found (Map 4D).

*Cyclosa huila* new species  
Figures 154–161; Map 4D

*Holotype.* Female holotype from Finca Meremberg, 10 km E Santa Leticia [2°20'N, 76°13'W], 2,300 m elev., Depto. Huila, Colombia, Nov. 1979 (W. Eberhard, 1867a), in MCZ. The specific name is a noun in apposition after the locality.

*Description.* Female holotype. Carapace dark brown (Fig. 156). Abdomen [poorly preserved in holotype] pear-shaped (Figs. 156, 157). Total length 5.0 mm. Carapace 1.5 mm long, 1.3 wide in thoracic region, 0.7 wide behind posterior lateral eyes. First femur 1.7 mm, patella and tibia 1.9, metatarsus 1.0, tarsus 0.6. Second patella and tibia 1.6 mm, third 1.0, fourth 1.7.

Femora shorter than corresponding patellae and tibiae.

Male from Saladito. Coloration darker than that of female. Sternum dark brown. Abdomen dark with dorsal markings (Fig. 158), venter black with one pair of discrete white patches. Abdomen oval, with small posterior median tubercle (Fig. 158). Total length 2.7 mm. Carapace 1.63 mm long, 1.25 wide in thoracic region, 0.49 wide behind posterior lateral eyes. First femur 1.46 mm, patella and tibia 1.40, metatarsus 0.79, tarsus 0.46. Second patella and tibia 1.14 mm, third 0.65, fourth 1.30. Femora slightly longer than corresponding patellae and tibiae, except fourth, which is equal.

*Note.* Males and females were collected together at Saladito.

*Variation.* Total length of females 4.9 to 6.4 mm. The illustrations were made from female holotype and a male from Saladito.

*Diagnosis.* The female has a set off posterior extension on the abdomen (Fig. 157), and the epigynum depression in ventral view has two pairs of lips (Fig. 154) (Two pairs of lips can be seen in some other species in subventral view.) The male has a wide, parrot beak-shaped conductor (Fig. 159), and the median apophysis has a symmetrical lobe (Fig. 161).

*Natural History.* A vial contains a note with the comment that the species is social. The specimen from Dept. Nariño came from lowland rainforest.

*Distribution.* Southwestern Colombia (Map 4D).

*Specimens Examined.* COLOMBIA *Valle:* Saladito, km 15 on road from Cali to Buenaventura, 1975, 1♀; Sept. 1975, 1♀; Oct. 1975, 1♀, 2♂ (all W. Eberhard, MCZ). *Nariño:* Jumin, West slope Andes, 340 m, 15 Dec. 1972, 3♀ (N. Leist, SMNK).

*Cyclosa caroli* (Hentz)  
Figures 162–180; Map 5D

*Epeira caroli* Hentz, 1850: 24, pl. 3, fig. 15. ♀. Female type from Alabama destroyed.

*Cyclosa lacerta* O. P.-Cambridge, 1859: 50, pl. 7, fig. 14. ♂. Male lectotype designated by Levi (1977: 82) from Guatemala or Panama in BMNH, no. 1905.4.28.2846, examined. Keyserling, 1893: 275,

- pl. 14, fig. 204, ♂. F. P.-Cambridge, 1904: 494, pl. 47, fig. 3, ♂. Synonymized by Levi (1977).
- Cyclosa caroli*.—Keyserling, 1893: 272, pl. 14, fig. 202, ♀. McCook, 1894: 277, pl. 17, figs. 7, 8, ♀, ♂. F. P.-Cambridge, 1904: 494, pl. 47, fig. 4, ♀. Roewer, 1942: 761. Bonnet, 1956: 1310. Levi 1977: 82, figs. 51–63, ♀, ♂.
- Cyclosa elongata* Franganillo, 1930: 68. Type specimen from Sierra Maestra and Montañas de Trinidad, Cuba, lost.

**Description.** Female from Chicanna Ruins, Mexico. Carapace dark brown, cephalic region darkest, lightest in posterior median region (Fig. 167). Abdomen venter dusky with black around spinnerets (Fig. 168). Abdomen with median posterior extension without tubercles (Figs. 167–169). Total length 6.0 mm. Carapace 1.74 mm long, 1.17 wide in thoracic region, 0.66 wide behind posterior lateral eyes. First femur 1.45 mm, patella and tibia 1.72, metatarsus 0.98, tarsus 0.52. Second patella and tibia 1.51 mm, third 0.87, fourth 1.52. Femora shorter than corresponding patellae and tibiae except third, which is of same length.

Male from Las Tuxtlas, Mexico. Carapace lighter than in female. Sternum dark brown. Abdomen darker than in female (Fig. 171), venter gray to black. Total length 3.1 mm. Carapace 1.50 mm long, 1.14 wide in thoracic region, 0.43 wide behind posterior lateral eyes. First femur 1.27 mm, patella and tibia 1.33, metatarsus 0.85, tarsus 0.42. Second patella and tibia 1.05 mm, third 0.63, fourth 1.20. Femora longer than corresponding patellae and tibiae, except fourth is the same length (male from Colombia).

**Note.** Males and females were collected together.

**Variation.** Total length of females 3.5 to 8.2 mm, most 5 and 7 mm; total length of males 2.5 to 4.2 mm, most between 2.5 and 3.5. Figures 162, 163, 172–176 were made from Mexican specimens; Figure 164 from a female from Colombia; Figure 165, 166, 177–180 from Bolivia; and Figure 170 from Peru.

**Diagnosis.** Unlike other species, *C. caroli* has the depressions hidden behind the

base of a nearly round scape (Figs. 162, 164, 165); there are usually short, almost circular brows, and the posterior median plate is small (Figs. 163, 166). Females differ from *C. tapetifaciens* by having a slender abdomen (Figs. 167–169). The palpus of males has a wide conductor tooth (Figs. 173, 176, 177, 180) and a lobe and long distal tooth on the median apophysis (Fig. 172); it differs from similar species by having the conductor lobe projecting above the tooth in mesal view of the palpus (arrow in Fig. 173).

**Natural History.** Females have been collected at night in a coffee plantation in Puerto Rico; in rain forest in Chiapas, Mexico; in understory of rain forest at La Selva, Costa Rica; in wet forest and humid forest with cacao in Limon Prov., Costa Rica; by beating forest vegetation in Venezuela; from river vegetation in Magdalena, Colombia; in secondary oak forest in Boyaca, Colombia; and in high forest, Bolivia. Males have been collected in grassland edge of forest in Venezuela.

**Distribution.** Widespread from southeastern United States to Bolivia and São Paulo State, Brazil (Map 5D).

**Specimens Examined.** MEXICO *Baja California Sur*: 63 km S La Paz, road to Todas Santos, ♀ (CAS). *San Luis Potosí*: Huichihuyuan, 21°19'N, 98°50'W ♀ (AMNH); 1.6 km W Tamazunchale, ♀ (AMNH); 8 km N Tamazunchale, ♀ (AMNH); Valles, ♀ (AMNH). *Veracruz*: Las Tuxtlas, 15 km N Catemaco, 50 m, 18°37'N, 95°07'W, ♀ ♂ (MCZ); Lago Catemaco, La Jungla 18°27'N, 95°05'W, ♀ (MCZ); La Buena Ventura, ♀ (AMNH); Fortín, ♀ (AMNH); Mirador Zacuapan, ♂ (AMNH); Potrero, ♀ (AMNH); 14.4 km SSW Veracruz, ♀ (AMNH). *Campeche*: Chicanna Ruins, 8 km W Xpujil, ♀ (W. Maddison, MCZ); 6 km W Francisco Escárcega, 18°37'N, 90°46'W, ♀ (MCZ). *Quintana Roo*: Kohunlich Ruins, 9 km S Francisco Villa, ♀ (W. Maddison, R. S. Anderson, MCZ). *Chiapas*: Selva del Ocote, 32 km W Ocozacoautla, 762 m, ♀ (CAS); La Zacuapala, ♀ (AMNH); 9.6 km Finca Santa María, Huehuetan, ♂ (AMNH); Tapachula, ♀ (CAS). GUATEMALA Cobán, 1♂ (AMNH); Quirigua, ♀ (MCZ); Tikal, El Petén ♂ (CAS). COSTA RICA very common. PANAMA very common.

BAHAMA ISL. South Bimini, ♀ (AMNH). CUBA *Cienfuegos*: Soledad, ♂ (MCZ); Sierra de Trinidad, Mina Carlota, ♀ (MCZ). *La Havana*: La Havana, ♀ (MCZ); Río Ariguanabo, Antonio de los Baños, ♀ (MCZ); Cueva de Rincón de Guanabo, ♀ (AMNH).

*Isla de Pines*: Sierra las Casas, ♀ (AMNH). *Santa Clara*: Vega Alta, ♀ (AMNH). GRAND CAYMAN ISLAND ♀ (MCZ). JAMAICA Westmoreland: Ne-gril, ♀ (MCZ). *St. Andrew Par.*: Hope Gardens, ♀ (MCZ). DOMINICAN REPUBLIC Sabana de la Mar, ♀ (MCZ). PUERTO RICO Hacienda Juanita, Maricao, ♀ (MCZ); Mayagüez, ♀ (AMNH). LESSER ANTILLES *Eustatius*: The Quill, 250 m, ♀ ♂ (AMNH). *Grenada*: Grand Etang, ♀ (MCZ). *St. Vincent*: ♀ (MCZ). *Guadeloupe*: Basse Terre, 3–4 km W Moustique, ♀ (ANSP); nr. Govarie W Moustique Island, ♀ (MCZ); Point-a-Pitre, ♀ (AMNH). *Moutser-rat*: Gage's Soufrière, ♀ (AMNH). TRINIDAD St. Augustine, ♂ (AMNH); St. Augustine River, ♀ (MCZ); St. Augustine Univ. Campus, ♀ ♂ (MCZ); *St. George*: Simla, Arima Valley, ♀ (AMNH).

VENEZUELA *Barinas*: main road betw. Barinas and Ciudad Bolivia, ♀ (USNM). *Guarica*: Guatapo Natl. Pk., Río Oritugo, ♂ (AMNH). *Bolívar*: 26 km N Yuruaní, Gu. Sabana, ♂ (AMNH). GUYANA *Kar-tabo*, ♀ (AMNH); Rupununi River nr. Mount Mak-arapan, ♀ (AMNH). COLOMBIA *Magdalena*: Pueblo Bello, Sierra Nevada de Santa Marta, ♂ (AMNH). *Boyacá*: Villa de Leiva, 2,450 m, 05°42'N, 73°29'W ♀ (MCZ). *Cundinamarca*: Finca Bella Vista nr. Sasaima, ♂ (CAS). *Meta*: Carimagua, ♀ ♂ (MCZ); Lom-alinda nr. Puerto Lleras, ♀ ♂ (MCZ). *CAS*: 15 km SW Puerto Lopez, ♀ ♂ (MCZ); 6 km SW Puerto Lopez, ♀ ♂ (MCZ). *Antioquia*: Guarne, 2,000 m, ♂ (MCZ); San Vicente, ♀ (MCZ). *Córdoba*: Ayapel nr. Ciénaga, ♀ ♂ (MCZ). *Valle*: Anicaya, ♀ (MCZ); 50 km S Buenaventura (MCZ); Lago Calima, betw. Buga & Loboquerrero, ♀ (MCZ); 21 km W Cali, ♀ ♂ (CAS); Río San Juan, aff. del Digna, nr. Quereamal, ♀ (MCZ); above Saladito, 1,500 m, ♀ ♂ (MCZ); nr. Saladito, 1,600 m, ♀ ♂ (MCZ). *Cauca*: 90 km S Cali, ♀ ♂; betw. Prendama & Monodomo, ♀ (MCZ); N of Prendama, ♀ (MCZ); 10 km N Piendano, ♀ ♂ (MCZ). *Nariño*: La Planada, 7 km S Chocones, 1,500 m, ♀ ♂ (MCZ); La Espiella, 50 m, ♀ (CV). Chachaquil nr. airport, ♀ (SMNK). ECUADOR *Sucumbios*: Cuyabeno, bridge over Cuyabeno, betw. Tarapoa and Tipishca, ♀ (MCZ); Reserva Faunística Cuyabeno, Laguna Grande, 2–5 Aug. 1958, ♀ (MCZ). *Imbabura*: Los Cedros, Biological Sta., 00°15'S, 75°46'W, ♀ (MCZ). *Pichincha*: Río Flor Palmeras, ♀ (MECN); 4 km NE Pedro Vicente Madonado, km 113 on road Quito to Puerto Quito, ♂ (MCZ); Timalandia nr. Santo Do-

mingo de las Colorados, ♀ (CAS). *Mauabi*: Manta, ♀ ♂ (CAS). *Chimborazo*: Amula, ♀ (MNHN 10498). *Guayas*: Guayaquil, ♀ ♂ (CAS). *El Oro*: Buenavista, 20 km SE Machala, ♀ ♂ (CAS). PERU *Loreto*: Jenaro Herrera, ♀ (MUSM). *Piura*: Quebrada Paríñas, ♀ ♂ (CAS); Quebrada Sangora, ♀ (CAS); Quebrada Moggollon, ♀ ♂ (CAS); El Muerto, ♀ ♂ (CAS). *Pasco*: Oxapampa, ♀ (MUSM). *Madre de Dios*: Zona Reser-vada Pakitza, ♀ (MUSM, USNM). *Cuzco*: Wiñay-huaina, 13°07'S, 72°34'W, 2,700–3,100 m, ♀ (MUSM). BRAZIL *Roraima*: Ilha de Maracá, Río Ur-aricoera, ♀ (MCN 27082, 27083); ♀ (INPA); Ularacá, ♀ (INPA). *Amazonas*: Reserva Ducke, 80 km N Mana-us, ♀ (MCN 27086). *Pernambuco*: Dois Irmãos, ♀ (MCN 25792). *Mato Grosso*: Chavautina, ♀ (MZSP 1324, 1325, 4541). *Espírito Santo*: Reserva Florestal de Linhares, ♀ (MCZ). *São Paulo*: Campos do Jor-dão, ♀ (MZSP 1318). BOLIVIA *Beni*: Estacion Biolo-gica, ♀ (USNM). *La Paz*: Sainani, Vale de Zongo, ♀ ♂ (MCN).

### *Cyclosa tapetifaciens* Hingston Figures 181–194; Map 5A

*Cyclosa tapetifaciens* Hingston, 1932: 80, 370. Female holotype from Essequibo River, Guyana, in BMNH, lost. Female neotype, here designated, from Santarém, Alter de Chão, Est. Pará, Brazil, 26 Jan. 1994 (H. Höfer), in MCN 25284. The neotype was collected with another female and a male. Roever, 1942: 760. Bonnet, 1956: 1324.

♀ *Cyclosa tremula* Hingston, 1932: 95, 370. Male (?) from Essequibo River, Guyana, lost. Roever, 1942: 760. Bonnet, 1956: 1324. NEW SYNONYMY.

*Cyclosa sibiobliqua* Hingston, 1932: 108, 121, 371. Immature from Essequibo River, Guyana, lost. Roever, 1942: 759. Bonnet, 1956: 1316. NEW SYNONYMY.

*Parazygia accentototata* di Caporiacco, 1955: 345, fig. 30, ♂. Male holotype from Rancho Grande, Aragua, Venezuela, in MBCV: Caracas, examined. NEW SYNONYMY.

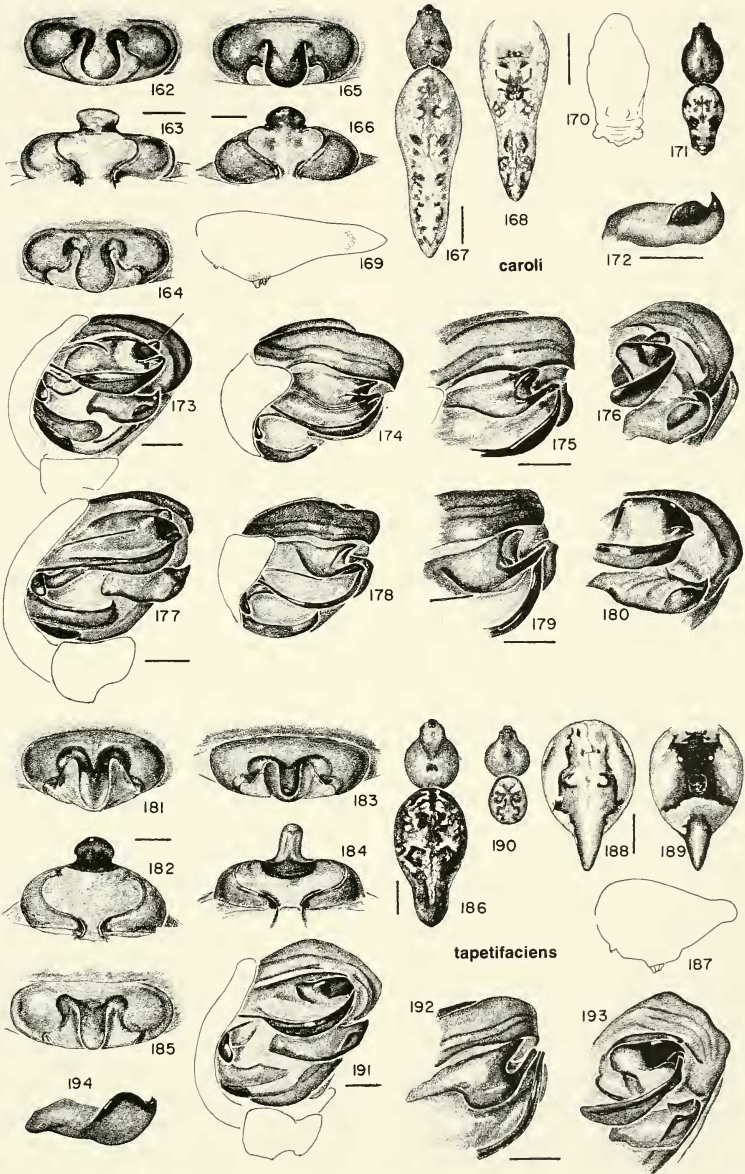
*Cyclosa sunaqqay* Archer, 1971: 150, fig. 7, ♀. Female holotype from Tingo María, Depto. Huánuco, Peru, in AMNH, examined. Brignoli, 1983: 266. NEW SYNONYMY.

*Note.* The diagnostic features described

Figures 162–180. *Cyclosa caroli* (Hentz), 162–170, female. 162–166, epigynum. 162, 164, 165, ventral. 163, 166, posterior. 162, 163, (Mexico). 164, (Depto. Nariño, Colombia). 165, 166, (Beni Prov., Bolivia). 167, dorsal. 168, abdomen, ventral. 169, abdomen, lateral. 170, shrivelled abdomen (Depto. Piura, Peru). 171–180, male. 171, dorsal. 172–180, left palpus. 172, 176, 180, median apophysis. 173, 177, mesal. 174, 175, 178, 179, apical. 172–176, (Veracruz, Mexico). 177–180, (La Paz, Bolivia).

Figures 181–194. *C. tapetifaciens* (Hingston), 181–189, female. 181–185, epigynum. 181, 183, 185, ventral. 182, 184, posterior. 181, 182, (Santarém, Brazil). 183, 184, (Ecuador). 185, (Depto. Huánuco, Peru). 186, Dorsal. 187, abdomen, lateral. 188, abdomen, dorsal. 189, abdomen, ventral. 188, 189, (Mt. Neblina area, Venezuela). 190–194, male. 190, dorsal. 191–194, palpus. 191, mesal. 192, apical. 193, 194, median apophysis.

Scale lines: 1.0 mm; genitalia 0.1 mm.





by Hingston for *C. tapetifaciens* are the oval abdomen, less elongated than in *C. caroli*, which this species resembles; lacking shoulder humps, and having the posterior end pointed, without tubercles. Total length 4 mm. A specimen collected by Hassler from Guyana (AMNH) was determined by Caporiacco as *C. tapetifaciens* (as were specimens of some different species).

*Cyclosa tremula* (2 mm in total length) and *C. filioblilqua*, (1.75 mm long) both have the abdomen oval, not elongated, no shoulder humps, and posterior pointed with no protuberances. Both are probably *C. tapetifaciens*.

*Description.* Female from Sauri-Wau River, Guyana. Carapace yellow, thoracic region brown (Fig. 186). Abdomen venter contrasting white and black. Abdomen without dorsal tubercles (Figs. 186, 187). Total length 5.4 mm. Carapace 1.9 mm long, 1.3 wide in thoracic region, 0.8 wide behind posterior lateral eyes. First femur 1.9 mm, patella and tibia 2.3, metatarsus 1.4, tarsus 0.6. Second patella and tibia 1.9 mm, third 1.1, fourth 1.9. All femora shorter than corresponding patella and tibia.

Male from Santarém, Brazil. Carapace brown with a pair of lighter areas, side by side in middle of thorax (Fig. 190). Abdomen with usual pattern (Fig. 190), venter black with a pair of white spots. Total length 3.2 mm. Carapace 1.69 mm long, 1.37 wide in thoracic region, 0.48 wide behind posterior lateral eyes. First femur 1.65 mm, patella and tibia 1.72, metatarsus 1.04, tarsus 0.52. Second patella and tibia 1.27 mm, third 0.78, fourth 1.53. First femora shorter than corresponding patellae and tibiae, second same length, third and fourth longer.

*Note.* Males and females have been collected together.

*Variation.* Total length of females 4.4 to 7.7 mm, males 2.7 to 3.7. Some Peruvian specimens have an all-white sternum. One specimen from near Mt. Neblina, Venezuela, had a contrasting pattern, unlike all

others (Figs. 188, 189). The male illustrated came from Santarém, Brazil.

*Diagnosis.* The scape of the epigynum is wide and the diameter of the depression on each side small, less than the diameter of the scape, the brow slightly wider than the scape (Figs. 181, 183, 185). The posterior median plate (Figs. 182, 184) is wider than that of *C. caroli* (Fig. 163). The palpus differs from others in that the notch of the conductor has parallel sides (Fig. 192) and the tooth of the median apophysis is shorter than the height of the lobe (Fig. 194), whereas the tooth of the median apophysis of *C. caroli* is equal to the height of the lobe (Fig. 172).

*Natural History.* Specimens were collected in moist tropical forest in Depto. Meta, Colombia; in secondary rain forest in Depto. Nariño, Colombia, from low foliage in Neblina Mountain vicinity; in forests near Belém; in campo grassland and dry forest north of Xavantina, Brazil; by canopy fogging at Tambopata, Peru; and has been found as prey of sphecoid wasps north of Manaus.

*Distribution.* Widespread from Panama to Rio Grande do Sul, Brazil, and Misiones Prov., Argentina (Map 5A).

*Specimens Examined.* PANAMA *Chiriquí:* Bugaba, ♀ (MIUP); Cerro Cementerio, Bugaba, Río Mula, ♀ (MIUP); Panama City, ♀ (CAS). VENEZUELA *Monagas:* Caripe, outside Cueva del Guacharo, 1,065 m, ♀ (USNM). *Miranda:* 35 km N Altagraça, Guatopo Natl. Park, Agla Blanco, 400 m, ♀ (AMNH). *Aragua:* Henri Pittier Natl. Park, Rancho Grande, 1,500 m, ♀♂ (USNM); Rancho Grande, ♀ (AMNH); ♀♂ (AMNH); ♀ (AMNH). *Mérida:* La Carborra, NW Merida, road to Azuleta, 2,200 m, ♀ (MCZ). *Amazonas:* Cerro de la Neblina, 0°50'N, 66°10'W, ♀ (USNM). GUYANA Sauri-Wau River nr. Tacutu River, ♀ (AMNH); Tumatumari, ♀ (AMNH). SURINAM *Brokopondo:* Brownsberg, 4°50'N, 55°15'W, ♀ (MCZ). COLOMBIA *Meta:* Carimagua, ♀ (MCZ); Macarena, 450 m, Río Duda, 2°40'N, 74°10'W, ♀ (MCZ); Hacienda Mozambique, 15 km SW Puerto Lopez, ♀♂ (MCZ). *Antiochia:* San Vicente, ♀ (MCZ). *Valle:* Atuncela, ♀♂ (MCZ); nr. Cali, ♀ (MCZ); ♂ (MCZ); ♂ (MCZ); above Habana, 2,200 m [dead end road E Palmira], ♀ (MCZ); Río Jamundi nr. Cali, 1,000 m, ♀ (MCZ); ♀ (MCZ); Río Jamundi betw. Cali and Jamundi, ♀ (MCZ); ♀ (MCZ); Cent. Hid. Anchiaca, 400 m, ♂ (MCZ). *Amazonas:* Araracuara, ♀ (CV). *Nariño:* El Diviso,

560 m, ♀ (CV). ECUADOR *Sucumbios*: Reserva Forestal Cuyabeno, ♀ (MCZ); Cuyabeno Tarapoa, 0°07'S, 76°20'W, ♀ (MCZ); Cuyabeno bridge, road betw. Tarapoa and Tipishca, 0°01'S, 76°18'W, ♀ (MCZ). *Napo*: Pompeya, ♀ (MCZ). *Pichincha*: km 113 via Puerto Quito, ♀ (MCZ); ♀ (MECN); ♀♂ (MCZ); Pulumahud, ♀ (RSNB); Tinalandia, 12 km E Santo Domingo Colorados, ♀♂ (FSCA). *Bolivar*: Balzapampa, ♂ (AMNH). *Manabi*: above Pedernales, 0°02'N, 80°00'W, ♀ (MECN). *Guayas*: Colonche, ♀ (CAS); W Guayaquil, ♂ (CAS); 16 km N Manglaralto, ♀ (E. I. Schlinger, E. S. Ross, CAS); Milagro, ♀ (CAS). PERU *Loreto*: Explorama Lodge, 80 km NE Iquitos, ♀ (FSCA); Pebas (and São Paulo Olivença, Amazonas, Brazil), ♀ (MNHN 4095c); Río Samiria, 04°43'S, 74°18'W, ♀♂ (MUSM); Cocha Shinguito, 05°08'S, 74°45'W, ♀ (MUSM). *Piura*: Higuerón, Las Lomas, ♀♂ (CAS). *Ucayali*: Bosque Nacional A. von Humboldt, ♀ (MUSM). *Huánuco*: Cueva de las Lechuzas, ♀ (AMNH); 8 km W Las Palmas, ♀ (CAS); Panguana, 09°37'S, 74°56'W, ♀ (MCZ); Santa Teresa, Río Huallaga, 600 m, ♀ (CAS). *Pasco*: Oxapampa, ♀ (MUSM); 2 km La Suiza, Chantabamba, ♀ (MUSM). *Madre de Dios*: Zona Reservada Pakitza, 11°56'S, 71°17'W, ♀ (MUSM); ♀ (USNM); Zona Reservada Tambopata, Explorer's Inn, ♀ (MCZ); ♂ (USNM); ♀ (MCZ); ♀ (MUSM); ♀ (USNM). BRAZIL *Pará*: Belém, ♀ (MCZ); Fazenda Velha, Belém, ♀ (MACN). *Roraima*: Maraca Island, Rio Uraricoera, ♀ (MCN 27087). *Amazonas*: Río Autas, Cururuzinho, ♀ (NRMS); Manaus, ♂ (MACN); Smithsonian areas 80 km N Manaus, ♀♂ (SMNK); 80 km N Manaus, ♀ (MCZ); Colosso Reserve, 80 km N Manaus, ♀♂ (MCZ); Km 41 Reserve, 80 km N Manaus, ♀ (MCZ); Reserva C. de Powell, 80 km N Manaus, ♀ (MCZ); Manaus, Reserva Ducke, ♀ (MCN 27084); ♀ (MCN 23935); ♀ (MCN 22079); Curari Isl., Manaus, ♀ (MCN 27085); Ulanzus, ♀ (INPA); Estação Ecológica de Mamiravá, Tefé, ♀ (MCN 22930, 23112); Manés, ♀ (MCN 27081). *Goiás*: Rio Araguaia, Araguaças, ♀ (MZSP 1213). *Rondônia*: Abunã, ♀ (MCZ). *Bahia*: Encruzilhada, 900 m, ♀♂ (AMNH); Fazenda Almada, Urucuca, ♀ (MCN 10491); Fazenda São Roque, Camacan, ♀ (MCN 11043); Fazenda Matiapá, Camacan, ♀ (MCN 1193). *Espírito Santo*: Reserva Florestal de Linhares, ♀ (MCZ). *Mato Grosso*: Chapada da Guimarães, ♀ (MCP 2165); Chavantina, ♀ (MZSP 4541a); 260 km N Xavantina, 12°49'S, 51°46'W, ♀ (MCZ). *Mato Grosso do Sul*: Urubupungá Falls on Rio Paraná, 20°36'S, 51°33'W, ♀ (MZSP 13153). *Paraná*: Parque Nacional do Iguaçu, Foz do Iguaçu, ♀ (MCN 23499); ♀ (MCZ); ♀ (SMNK); Rio Negro, ♂ (MNRJ 58262); Salto Casias Rio Iguaçu, Capitão Leonidas, ♀ (MCN 23297). *Santa Catarina*: Nova Teutonia, ♂ (SMF). *Rio Grande do Sul*: Montenegro, ♀ (MCN 6807); São Leopoldo, ♀ (MCP 0346). PARAGUAY *Alto Paraná*: Taquarazapa, ♀ (AMNH). BOLIVIA Mamuré Geb. [Gebiet, Gebirge, ? area, mountains], northern Bolivia, ♀♂ (SMF). *Beni*: Estacion Biol. Beni, 14°47'S, 66°15'W, ♀ (USNM). *La Paz*: Cerro Uchumachi, 7 km SW Co-

roico, 16°15'S, 67°21'W, 1,900 m, ♀ (USNM). *Cochabamba*: Yungas Chaparé, ♀ (AMNH); Espiritu Santo, ♀ (MNHN 15716). ARGENTINA *Misiones*: Montecarlo, ♂ (MACN); Parque Nacional Iguazú, ♂ (MACN); Puerto Bemberg [Puerto Libertad], ♀ (MACN 3135); ♀ (MACN 2997); ♀ (MACN 3417); Puerto 17 Octubre [Puerto Libertad], ♀ (MACN 3859); Santa Ana, ♀ (MACN); Santa María, ♀ (MACN); ♀ (MACN 3591).

### *Cyclosa donking* new species Figures 195–198; Map 5B

*Holotype*. Female holotype from Estacion Biológica Beni, 14°47'S, 66°15'W, Depto. Beni, Bolivia, ca. 225 m, 8–11 Nov. 1959 (J. Coddington, S. Larcher, A. Penaranda, C. Griswold, D. Silva), in USNM. The specific name is an arbitrary combination of letters.

*Description*. Female holotype. Carapace yellow (Fig. 197). Coxae and distal leg articles yellow without rings. Abdomen dorsally white with dense white pigment spots (Fig. 197); venter with dense white pigment spots between epigynum and spinnerets, less dense in surrounding area. Abdomen elongate drop-shaped (Figs. 197, 198). Total length 7.0 mm. Carapace 2.0 mm long, 1.5 wide in thoracic region, 0.8 wide behind posterior lateral eyes. First femur 2.0 mm, patella and tibia 2.3, metatarsus 1.2, tarsus 0.6. Second patella and tibia 2.0 mm, third 1.2, fourth 1.9. Length of femora shorter than corresponding patellae and tibiae.

*Diagnosis*. This species is distinguished by the shape of the abdomen (Figs. 197, 198), the lack of black pigment and rings on legs, and by the shape of the epigynum, which is similar to that of *C. caroli* (Figs. 162, 163). The scape is not constricted at its base and the brows and depression are more posterior (Figs. 195, 196) than in *C. caroli*.

*Distribution*. Known only from type locality in Bolivia (Map 5B); no other specimens were collected.

### *Cyclosa oseret* new species Figures 199–203; Map 3C

*Holotype*. Female holotype from Teresópolis, 900 to 1,000 m, Est. Rio de Janeiro, Brazil, March 1946



(H. Sick), in AMNH. The specific name is an arbitrary combination of letters.

*Description.* Female holotype. Carapace yellow-white with a median tiny brown spot (Fig. 201). Sternum brown with an anterior transverse white line and posteriorly, a short, longitudinal white line. Abdomen white with a pair of indistinct spots in middle (Fig. 201); venter with black and white patches (Fig. 202). Abdomen with a pair of ventral tubercles and a median posterior extension (Fig. 203). Total length 4.1 mm. Carapace 1.53 mm long, 1.04 wide in thoracic region, 0.62 wide behind posterior lateral eyes. First femur 1.30 mm, patella and tibia 1.53, metatarsus 0.86, tarsus 0.47. Second patella and tibia 1.30 mm, third 0.79, fourth 1.30. All femora shorter than corresponding patellae and tibiae.

*Diagnosis.* *Cyclosa oseret* differs from others by having a round, stalked scape with a round depression on each side (Fig. 199).

*Distribution.* Known only from the type locality (Map 3C).

#### *Cyclosa turvo* new species

Figures 204–207; Map 3C

*Holotype.* Female holotype, from Parque do Turvo, Tenente Portela, Rio Grande do Sul, Brazil, 4–6 Feb. 1980 (A. A. Lise), in MCN no. 8969 A. The specific name is a noun in apposition after the locality.

*Description.* Female holotype. Carapace dark brown (Fig. 206). Sternum light brown with dark border. Abdomen venter black with U-shaped remnants of white patches. Abdomen with a posterior extension (Figs. 206, 207). Total length 4.7 mm. Carapace 1.2 mm long, 0.8 wide in thoracic region, 0.6 wide behind posterior lateral eyes. First femur 1.0 mm, patella and tibia 1.3, metatarsus 0.7, tarsus 0.4. Second patella and tibia 1.2 mm, third 0.6, fourth 1.1. Femora shorter than patella and tibia of same leg.

*Diagnosis.* *Cyclosa turvo* differs from *C. oseret* (Fig. 199) and *C. caroli* (Fig. 162) in that the scape of the epigynum lacks a constriction at its anterior end (Fig. 204)

and in having a large posterior median plate (Fig. 205).

*Distribution.* Known only from the type (Map 3C); no other specimens were found.

#### *Cyclosa mavaca* new species

Figures 208–211; Map 3B

*Holotype.* Female holotype and immature paratype from Alto Mavaca base camp, upper Río Mavaca, 225 m, 02°01'30"N, 65°07'00"W, Amazonas State, Venezuela, 31 Jan. 1989 (D. A. Polhemus), in USNM. The specific name is a noun in apposition after the locality.

*Description.* Female holotype. Carapace dark brown, lightest in eye region (Fig. 210). Sternum dark brown with anterior transverse white band and posterior, median white spot. Abdomen venter black between epigynum and spinnerets with an inverted white "T", the median white areas indistinct. Abdomen almost cylindrical (Figs. 210, 211). Total length 5.0 mm. Carapace 1.4 mm long, 0.9 wide in thoracic region, 0.5 wide behind posterior lateral eyes. First femur 1.1 mm, patella and tibia 1.4, metatarsus 0.7, tarsus 0.4. Second patella and tibia 1.1 mm, third 0.7, fourth 1.1. Femora shorter than corresponding patellae and tibiae, except third is of same length.

*Variation.* Total length of females 4.2 to 5.1 mm.

*Diagnosis.* This species is distinguished by the wide scape of the epigynum, wider than the lateral areas of the base (Fig. 208); the scape hides the openings. It differs from others with a round scape, except *C. turvo*, by the relatively wide posterior median plate (Fig. 209).

*Natural History.* Specimens came from vegetation.

*Distribution.* Known only from southern Venezuela and southeastern Colombia (Map 3B).

*Specimens Examined.* COLOMBIA Amazonas: Aracua, 270 m, 23 Feb. 1985, 2♀ (*C. Valderrama, CV, MCZ*).

*Cyclosa camargoi* new species  
Figures 212–217; Map 3C

*Holotype.* Female holotype from Campos do Jordão, São Paulo State, Brazil, 3 Jan. 1948 (F. Lane), in MZSP no. 1315. The species is named after the arachnologist H. F. de Almeida Camargo, who recognized that the specimen belonged to a new species.

*Note.* The specimen had been labeled *Cyclosa jordanensis* Camargo and Soares, holotype. Apparently it is a manuscript type and was never published.

*Description.* Female holotype. Carapace dark brown, eye region light yellowish (Fig. 216). Sternum light yellowish. Abdomen venter whitish with gray patches. Abdomen almost cylindrical, posterior almost as wide as anterior (Figs. 216, 217). Total length 7.0 mm. Carapace 2.0 mm long, 1.2 wide in thoracic region, 0.7 wide behind posterior lateral eyes. First femur 1.6 mm, patella and tibia 2.0, metatarsus 1.0, tarsus 0.6. Second patella and tibia 1.7 mm, third 1.0, fourth 1.6. Femora shorter than corresponding patellae and tibiae.

*Variation.* Total length of females 4.8 to 7.0 mm. Figures 212, 213, 216, 217 were made from the holotype.

*Diagnosis.* This species, like *C. caroli* (Fig. 162), has a wide, sometimes almost circular scape, but the median plate is wider both anteriorly and posteriorly (Figs. 212–215). The sculpturing of the base is difficult to see. The shape of the abdomen (Figs. 216, 217) is unlike that of any other American *Cyclosa* species.

*Distribution.* Southern Brazil (Map 3C).

*Specimens Examined.* BRAZIL *Rio de Janeiro:* Ilha Grande, sea level, 15 Mar. 1944, 1♀ (H. Sick, AMNH); Teresópolis, 1,000 m, 9 Mar. 1946, 1♀ (H. Sick, AMNH). *São Paulo:* Cocaia, Represa Nova, Santo Amaro, 4 Apr. 1948, 1♀ (H. Urban, MZSP 13160); Ilha São Sebastião, 16–19 Jan. 1950, 1♀ (H. Urban, MZSP 7696). *Rio Grande do Sul:* Esteio, 3 Aug. 1958, 1♀ (J. A. Petersen, MCP 3878).

*Cyclosa teresa* new species  
Figures 218–222; Map 5B

*Holotype.* Male holotype from Santa Teresa, Est. Espírito Santo, Brazil, 5 Oct. 1942 (B. Soares), in

MZSP no. 13150. The specific name is a noun in apposition after the locality.

*Description.* Male holotype. Carapace yellow and orange (Fig. 218). Chelicerae yellow. Labium, endites orange. Sternum orange with anterior transverse yellowish band. Coxae orange, first two femora orange; otherwise, legs yellow with orange rings. Dorsum of abdomen colorless with gray folium posteriorly, indistinct white patches anteriorly (Fig. 218), sides gray; venter gray with a pair of white spots. Total length 2.8 mm. Carapace 1.56 mm long, 1.23 wide in thoracic region, 0.48 wide behind posterior lateral eyes. First femur 1.56 mm, patella and tibia 1.53, metatarsus 0.96, tarsus 0.52. Second patella and tibia 1.23 mm, third 0.65, fourth 1.25. All femora slightly longer than corresponding patellae and tibiae.

*Variation.* Total length of males 2.8 to 3.0 mm. The illustrations were made from the holotype.

*Diagnosis.* Unlike other species, *C. teresa* has the notch of the conductor pointed in apical view (Fig. 220) and the tooth of the median apophysis behind the lobe (Figs. 221, 222). One male had ventral tubercles on the abdomen.

*Distribution.* Southeastern Brazil (Map 5B).

*Specimens examined.* BRAZIL *Santa Catarina:* Concordia, 27°08'S, 51°54'W, 30 Jan. 1996, 1♂ (A. B. Bonaldo, MCN 27267).

*Cyclosa dianasilvae* new species  
Figures 223–231; Map 5C

*Holotype.* Female holotype, male allotype, 16 female, four male and nine immature paratypes from Zona Reservada Tambopata, 290 m, 12°50'S, 69°17'W, Madre de Dios, Peru, 13 May 1988 (D. Silva), in MUSM, one pair in MCZ. The species is named after the collector and arachnologist Diana Silva.

*Description.* Female holotype. Carapace dark brown, eye region lighter (Fig. 225). Sternum dark brown without marks. Abdomen venter black with tiny white patches (Fig. 226). Abdomen with a median posterior extension and without dorsal tubercles (Figs. 225–227). Total length 4.3

mm. Carapace 1.5 mm long, 0.8 wide in thoracic region, 0.6 wide behind posterior lateral eyes. First femur 1.2 mm, patella and tibia 1.6, metatarsus 0.9, tarsus 0.5. Second patella and tibia 1.4 mm, third 0.8, fourth 1.3. Femora shorter than corresponding patellae and tibiae, except third is of equal length.

Male allotype. Coloration darker than in female. Sternum dark brown, unmarked. Legs yellow, not ringed. Abdomen venter black without white or paired white spots. Abdomen oval (Fig. 228). Total length 2.6 mm. Carapace 1.39 mm long, 0.97 wide in thoracic region, 0.41 wide behind posterior lateral eyes. First femur 1.07 mm, patella and tibia 1.17, metatarsus 0.74, tarsus 0.42. Second patella and tibia 1.00 mm, third 0.61, fourth 1.01. Femora shorter than corresponding patellae and tibiae, except third, which is slightly longer.

*Note.* Males and females were collected together.

*Variation.* Total length of females 3.8 to 6.0 mm, males 2.6 to 2.8 mm. The illustrations were made from the female holotype and male allotype.

*Diagnosis.* Unlike most species, *C. dianasilvae* has the sternum dark brown without marks. The epigynum differs from others by having the lateral plates in ventral view narrower than the median plate to the side of the scape (Fig. 223). The male has a distinct, wide notch on the conductor in apical view (Fig. 230), and the lobe of the median apophysis is pointed and without distal tooth (Fig. 231).

*Distribution.* Ecuador, Peru, Amazon area (Map 5C).

*Specimens Examined.* ECUADOR *Sucumbios*: Reserva Forestal Cuyabena, 23 July 1986, 1 ♀ (L. Avilés, MCZ). *Pastaza*: Puyo, 18 Apr. 1958, 1 ♂ (R. W. Hodges, MCZ). PERU *Loreto*: Jenaro Herrera, 04°45'S, 73°45'W, 26–28 Aug. 1988, 8 ♀, 1 ♂ (D. Silva,

MUSM). *Madre de Dios*: Zona Reservada Tambopata, 5 June 1988, 2 ♀ (D. Silva, MUSM); Zona Reservada Tambopata, Bosque Alto, 31 July 1987, 5 ♀ (D. Silva, MUSM).

### *Cyclosa cajamarca* new species Figures 232–235; Map 5C

*Holotype.* Female holotype, six female paratypes from Llana, 2,300 m, west slope of Andes, between Chiclayo and Cutervo, Depto. Cajamarca, Peru, 10 June 1956 (W. Weyrauch), in CAS, one paratype in MCZ. The specific name is a noun in apposition after the locality.

*Note.* The specimens are in poor condition and may once have been dry.

*Description.* Female holotype. Carapace brown, cephalic region yellowish (Fig. 234). Abdomen white with folium posteriorly (Fig. 234); venter black with five white patches, the median largest. Abdomen with a pair of dorsal tubercles and a median posterior extension (Figs. 234, 235). Total length 6.2 mm. Carapace 1.5 mm long, 1.1 wide in thoracic region, 0.7 wide behind posterior lateral eyes. First femur 1.4 mm, patella and tibia 1.9, metatarsus 1.0, tarsus 0.5. Second patella and tibia 1.6 mm, third 0.9, fourth 1.4. Femora shorter than corresponding patellae and tibiae, except third, which is the same length.

*Diagnosis.* *Cyclosa cajamarca* is distinguished by having the openings of the epigynum with a straight lip, parallel to the median axis of the spider (Fig. 232) and the posterior median plate relatively small (Fig. 233).

*Distribution.* Known only from type locality in Peru (Map 5C); no other specimens were found.

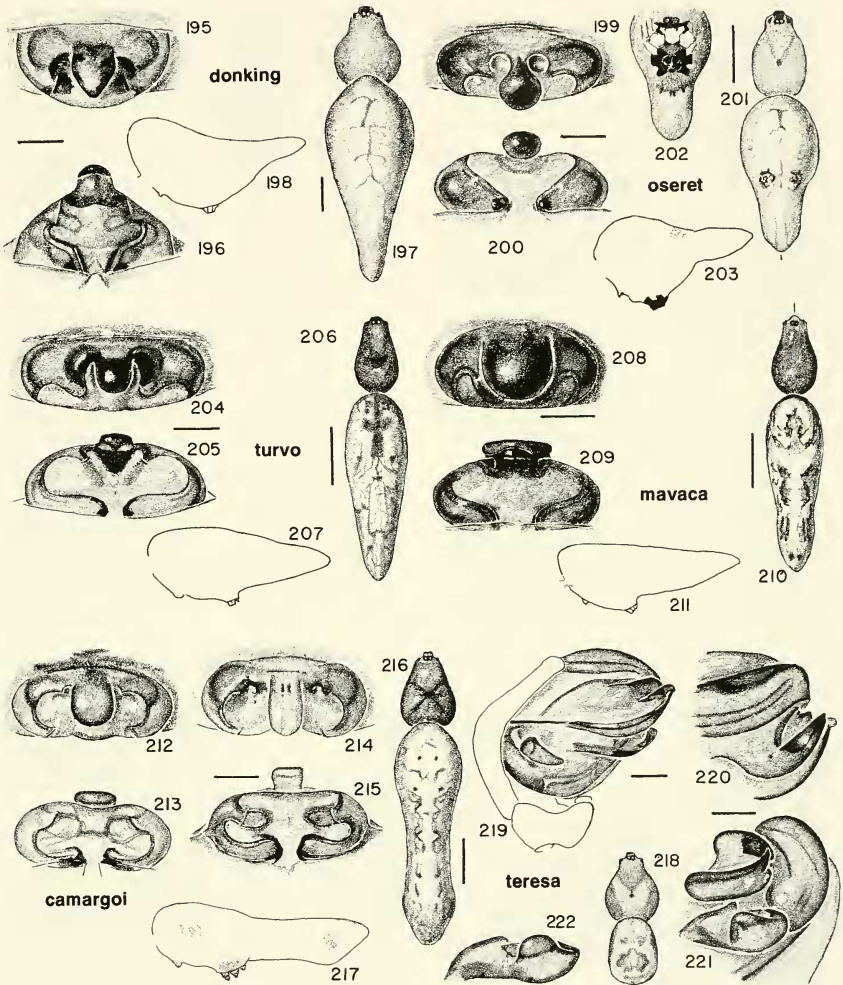
### *Cyclosa libertad* new species Figures 236–239; Map 4E

*Holotype.* Female holotype and one immature from between Chagnal (07°50'S, 77°35'W) and Patos

→

Figures 195–198. *Cyclosa donking* n. sp., female. 195, 196, epigynum. 195, ventral. 196, posterior. 197, dorsal. 198, abdomen, lateral.

Figures 199–203. *C. oseret* n. sp., female. 199, 200, epigynum. 199, ventral. 200, posterior. 201, dorsal. 202, abdomen, ventral. 203, abdomen, lateral.



Figures 204–207. *C. turvo* n. sp., female. 204, 205, epigynum. 204, ventral. 205, posterior. 206, dorsal. 207, abdomen, lateral.

Figures 208–211. *C. mavaca* n. sp., female. 208, 209, epigynum. 208, ventral. 209, posterior. 210, dorsal. 211, abdomen, lateral.

Figures 212–217. *C. camargoi* n. sp., female. 212–215, epigynum. 212, 214, ventral. 213, 215, posterior. 212, 213, (São Paulo, Brazil). 214, 215, (Rio Grande do Sul). 216, dorsal. 217, abdomen, lateral.

Figures 218–222. *C. teresa* n. sp., male. 218, dorsal. 219–222, left palpus. 219, mesal. 220, apical. 221, 222, median apophysis.

Scale lines: 1.0 mm; genitalia 0.1 mm.

(10°45'S, 71°45'W), 1,000 to 2,000 m, Depto. La Libertad, Peru, 27 Mar. 1988 (D. Silva D.), in MUSM. The specific name is a noun in apposition after the locality, La Libertad.

**Description.** Female holotype. Carapace brown, lighter between median and lateral eyes (Fig. 238). Abdomen venter black with a pair of distinct white patches and between them and slightly anterior, a median white patch. Abdomen with a pair of small dorsal tubercles and a median posterior extension (Figs. 238, 239). Total length 5.4 mm. Carapace 1.7 mm long, 1.2 wide in thoracic region, 0.6 wide behind posterior lateral eyes. First femur 1.5 mm, patella and tibia 1.7, metatarsus 0.9, tarsus 0.4. Second patella and tibia 1.5 mm, third 0.9, fourth 1.5. Femora shorter than corresponding patellae and tibiae, except third, which is of equal length.

**Variation.** Total length of females 5.3 to 6.8 mm. The specimen from Paute has the dorsal tubercles indistinct; the one from Baños tubercles and has a narrower abdomen.

**Diagnosis.** *Cyclosa libertad* is distinguished by having an anterior, dorsal pair of tubercles on the abdomen (Figs. 238, 239), whereas *C. tapetifaciens* lacks these tubercles (Figs. 186, 187); also in *C. libertad* the scape of the epigynum (Fig. 236) is narrower than that of *C. tapetifaciens* (Fig. 181).

**Distribution.** Ecuador and northeastern Peru (Map 4E).

**Specimens Examined.** ECUADOR *Tungurahua*: Baños, 1,900 m, Oct 1935, 1♀ (W. Clarke-Macintyre, AMNH). *Azuay*: 17.6 km E Paute, 17 Feb. 1955, 1♀ (E. I. Schlinger, E. S. Ross, CAS). PERU *La Libertad*: Pataz, 2,500 m, 16 June 1986, 1♀ (B. Roth, CAS). *Ancash*: Chiquian, Río Pativilca, 3,450 m, 7 Mar. 1956, 2♀ (F. Weyrauch, CAS).

### *Cyclosa curiraba* new species Figures 240–243; Map 5C

**Holotype.** Female holotype from Estacion Biológica Beni, trail south of camp in area of Río Curiraba and toward savanna. Dpto. Beni, Bolivia, 6 Sept. 1987 (S. Larcher, J. Coddington, J. P. Arce), in USNM. The specific name is a noun in apposition after the locality.

**Description.** Female holotype. Carapace yellow with brown frame around thoracic region. Abdomen venter between epigynum and spinnerets black containing a pair of large white patches and scattered small white spots. Abdomen pear-shaped (Figs. 242, 243). Total length 5.4 mm. Carapace 1.7 mm long, 1.3 wide in thoracic region, 0.7 wide behind posterior lateral eyes. First femur 1.7 mm, patella and tibia 1.9, metatarsus 1.1, tarsus 0.5. Second patella and tibia 1.6 mm, third 1.0, fourth 1.7. Femora shorter than corresponding patellae and tibiae.

**Variation.** Total length of females 4.6 to 5.4 mm. In the female from Yucomo, the scape is wider than in other specimens. The illustrations were made from the holotype and another specimen.

**Diagnosis.** This species is distinguished from other *Cyclosa* species with a pear-shaped abdomen by the V-shaped brows of the epigynum (Fig. 240) and the triangular posterior median plate (Fig. 241).

**Distribution.** Bolivia (Map 5C).

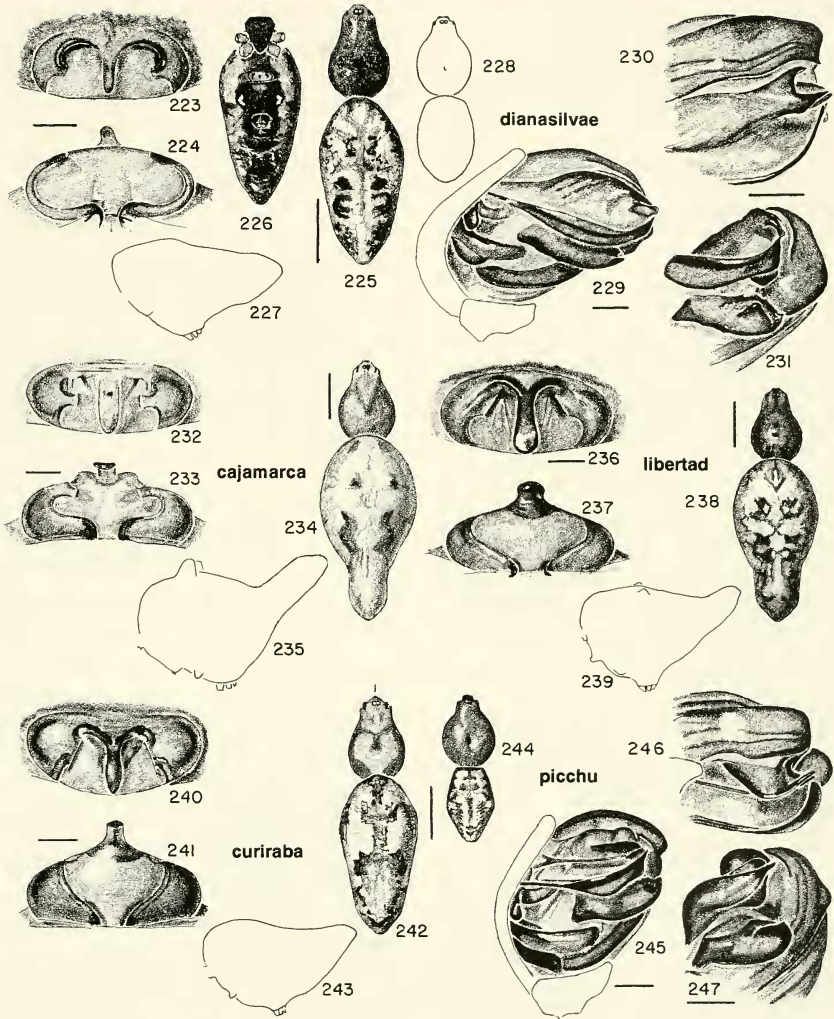
**Specimens Examined.** BOLIVIA *Beni*: 27 km SW Yucomo, 15°23'S, 66°59'W, 15–19 Nov. 1989, 1♀ (J. Coddington et al., USNM); Estacion Biológica Beni, 5 km N Est. El Porvenir, 14 Sept. 1987, 3♀ (J. Coddington et al., USNM, MCZ); Estacion Biológica Beni, 8–14 Nov. 1989, 2♀ (J. Coddington et al., USNM).

→

Figures 223–231. *Cyclosa dianasilvae* n. sp. 223–227, female. 223, 224, epigynum. 223, ventral. 224, posterior. 225, dorsal. 226, abdomen, ventral. 227, abdomen, lateral. 228–231, male. 228, dorsal. 229–231, left palpus. 229, mesal. 230, apical. 231, median apophysis.

Figures 232–235. *C. cajamarca* n. sp., female. 232, 233, epigynum. 232, ventral. 233, posterior. 234, dorsal. 235, abdomen, lateral.





Figures 236–239. *C. libertad* n. sp., female. 236, 237, epigynum. 236, ventral. 237, posterior. 238, dorsal. 239, abdomen, lateral.

Figures 240–243. *C. curiraba* n. sp., female. 240, 241, epigynum. 240, ventral. 241, posterior. 242, dorsal. 243, abdomen, lateral.

Figures 244–247. *C. picchu* n. sp., male. 244, dorsal. 245–247, palpus. 245, mesal. 246, apical. 247, median apophysis.

Scale lines: 1.0 mm; genitalia 0.1 mm.



***Cyclosa picchu* new species**

Figures 244–247; Map 5C

*Holotype.* Male holotype from Machupicchu, 2,100 m, Depto. Cuzco, Peru, among ruins, 19 Feb. 1965 (H. Levi), in MCZ. The specific name is a noun in apposition after the locality.

*Description.* Male holotype. Carapace dark brown (Fig. 244). Sternum dark brown. Abdomen venter black with a pair of white patches. Abdomen pointed (Fig. 244). Total length 2.9 mm. Carapace 1.49 mm long, 1.07 wide in thoracic region, 0.41 wide behind posterior lateral eyes. First femur 1.32 mm, patella and tibia 1.39, metatarsus 0.81, tarsus 0.44. Second patella and tibia 1.14 mm, third 0.62, fourth 1.16. Femora shorter than corresponding patellae and tibiae, except third, which is longer.

*Variation.* Total length of males 2.7 to 2.9 mm. The illustrations were made from the holotype. The holotype has the posterior median eyes fused, apparently an abnormality. The second specimen has all eyes larger than in the holotype and the posterior medians are separate.

*Diagnosis.* The lobe of the median apophysis of *C. picchu* is fused with the distal tooth (Fig. 247), unlike that of other *Cyclosa*.

*Distribution.* Peruvian Andes (Map 5C).

*Specimens Examined.* PERU Cuzco: Machupicchu, ruins, bamboo cloud forest, 2,400 m, 16 Oct. 1957, 1♂ (J. Coddington, USNM).

***Cyclosa pantanal* new species**

Figures 248–255; Map 6G

*Holotype.* Female holotype from Pantanal, Mato Grosso, Brazil, 4–10 Aug. 1992 (A. A. Lise, J. A. Beaul, Jr.), in MNP no. 2337. The specific name is a noun in apposition after the locality.

*Description.* Female holotype. Carapace

yellowish and brown (Fig. 250). Abdomen venter with black and white patches. Abdomen without dorsal tubercles, but with a median posterior extension (Figs. 250, 251). Total length 5.5 mm. Carapace 1.7 mm long, 1.2 wide in thoracic region, 0.7 wide behind posterior lateral eyes. First femur 1.8 mm, patella and tibia 1.8, metatarsus 1.1, tarsus 0.4. Second patella and tibia 1.6 mm, third 1.0, fourth 1.7. All femora equal to or slightly shorter than corresponding patellae and tibiae.

Male. Carapace beige, with sides of thoracic region dark gray posteriorly (Fig. 252). Dorsum of abdomen with black, gray and white marks (Fig. 252); venter black with a pair of white patches. Posterior median eyes and laterals slightly smaller than anterior medians. Abdomen oval (Fig. 252). Total length 2.6 mm. Carapace 1.37 mm long, 1.13 wide in thoracic region, 0.42 wide behind posterior lateral eyes. First femur 1.30 mm, patella and tibia 1.23, metatarsus 0.78, tarsus 0.45. Second patella and tibia 0.94 mm, third 0.55, fourth 1.14. Femora slightly longer than corresponding patellae and tibiae.

*Note.* The association of male and female is uncertain.

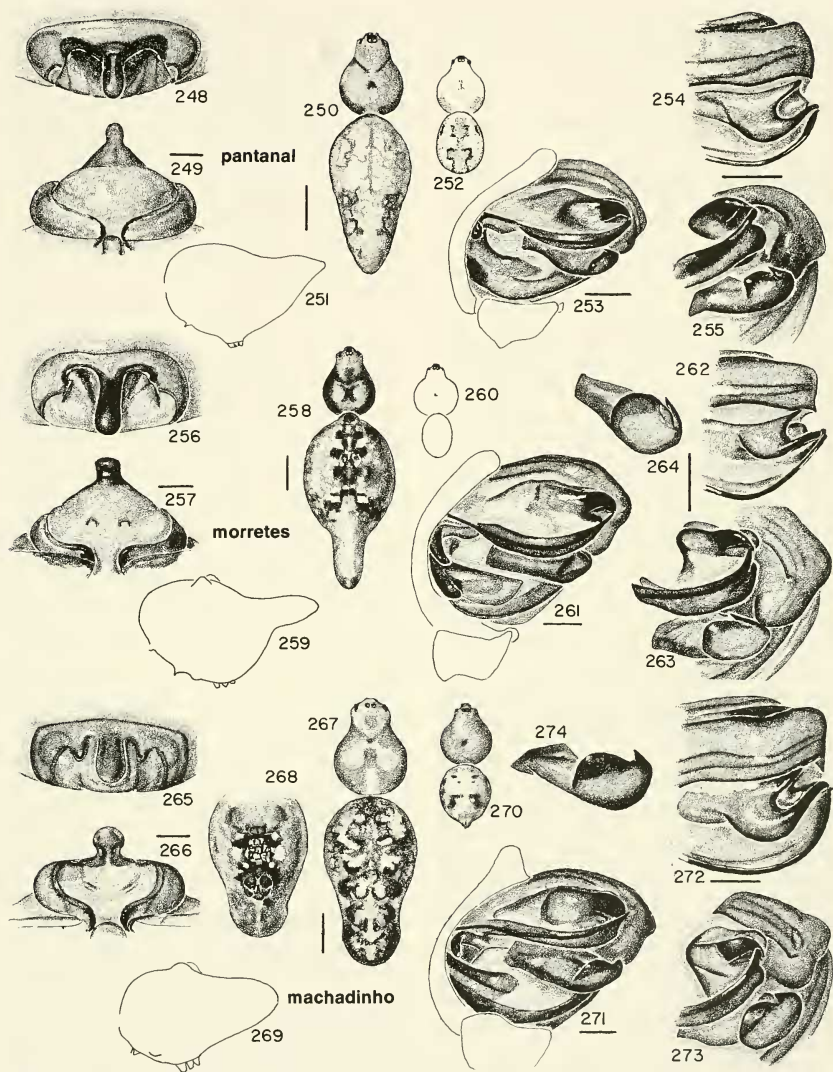
*Variation.* Total length of females 5.2 to 5.5 mm. The illustrations were made from the female holotype.

*Diagnosis.* *Cyclosa pantanal* is similar to *C. morretes* but differs by lacking dorsal abdominal tubercles (Fig. 250), in having a slightly wider depression on each side of the scape of the epigynum and in having the more sclerotized area in each depression more transverse (Fig. 248) than in *C. morretes* (Fig. 256).

*Distribution.* Mato Grosso, Brazil (Map 6G).

Figures 248–255. *Cyclosa pantanal* n. sp. 248–251, female. 248, 249, epigynum. 248, ventral. 249, posterior. 250, dorsal. 251, abdomen, lateral. 252–255, male (questionable association). 252, dorsal. 253–255, left palpus. 253, mesal. 254, apical. 255, median apophysis.

Figures 256–264. *C. morretes* n. sp. 256–259, female. 256, 257, epigynum. 256, ventral. 257, posterior. 258, dorsal. 259, abdomen, lateral. 260–264, male. 261–264, palpus. 261, mesal. 262, apical. 263, 264, median apophysis.



Figures 265-274. *C. machadinho* n. sp. 265-269, female. 265, 266, epigynum. 265, ventral. 266, posterior. 267, dorsal. 268, abdomen, ventral. 269, abdomen lateral. 270-274, male. 270, dorsal. 271-274, left palpus. 271, mesal. 272, apical. 273, 274, median apophysis.

Scale lines: 1.0 mm; genitalia 0.1 mm.

*Specimens Examined.* BRAZIL *Mato Grosso:* Chavantina, Oct. 1946, 1♀ (H. Sick, MZSP 1227); Fazenda Sta. Inês, Poconé, 4–10 Aug. 1992, 1♂ (A. A. Lise, J. A. Beaul, Jr., MCP 2567).

### *Cyclosa morretes* new species

Figures 256–264; Map 6G

*Holotype.* Female holotype from Morretes, Est. Paraná, Brazil, 28, 29 Oct. 1995 (A. B. Bonaldo), in MCN no. 26727. The specific name is a noun in apposition after the locality.

*Description.* Female holotype. Carapace yellow with brown margin, median brown band and groove between cephalic and thoracic region brown (Fig. 258). Sternum colorless with white patches and brown outline. Abdomen venter with black and white patches. Anterior of abdomen stout with a pair of dorsal tubercles and a median posterior extension (Figs. 258, 259). All females have ventral tubercles (Fig. 259). Total length 7.2 mm. Carapace 2.0 mm long, 1.4 wide in thoracic region, 0.8 wide behind posterior lateral eyes. First femur 2.3 mm, patella and tibia 2.4, metatarsus 1.4, tarsus 0.8. Second patella and tibia 2.0 mm, third 1.1, fourth 1.9. All femora about same length as corresponding patella and tibia.

Male from Viamão, Rio Grande do Sul. Carapace dark brown. Distal leg articles orange. Abdomen black with some gray patches on sides. Abdomen with a posterior median point. Total length 2.8 mm. Carapace 1.72 mm long, 1.38 wide in thoracic region, 0.53 wide behind posterior lateral eyes. First femur 1.43 mm, patella and tibia 1.56, metatarsus 1.04, tarsus 0.49. Second patella and tibia 1.33 mm, third 0.83, fourth 1.27.

Males and females were collected together only at Viamão, Brazil (MCN 5866). A female from Pelotas (MCN 28160) was collected with a male of *C. espumoso*.

*Variation.* Total length of females 5.0 to 7.8 mm, males 2.6 to 3.1. Females occasionally lack the dorsal pair of tubercles. The illustrations were made from female holotype and male from Viamão.

*Diagnosis.* Females are separated from *C. pantanal* by the shape of the mucus area and depression of the epigynum, more longitudinal in *C. morretes* (Fig. 256) than in *C. pantanal* (Fig. 248). The male is similar to that of *C. pantanal* but differs in the shape of the conductor notch (Fig. 262) and smaller lobe of the median apophysis (Figs. 261, 263). The male differs from that of *C. machadinho* (Fig. 274) by having the median apophysis tooth behind the lobe (Fig. 263).

*Distribution.* Southern Brazil (Map 6G).

*Specimens Examined.* BRAZIL *Pará:* Belém, July 1971, 1♀ (T. McGrath, MCZ). *Minas Gerais:* Pedra Azul, Dec. 1970, 1♂ (F. M. Oliveira, AMNH). *Espírito Santo:* Reserva Florestal de Linhares, 25 July 1994, 1♀ (J. Vasconcellos-Neto, MCZ). *Rio de Janeiro:* Angra dos Reis, 1♂ (MZSP 9607); Petrópolis, 1♂ (MNRJ); 2–5 Nov. 1945, 1♀ (H. Sick, AMNH); Rio de Janeiro, Jardim Botânico, 31 Mar. 1957, 1♂ (H. L. Levi, MCZ); Teresópolis, 900–1,000 m, 7–9 Nov. 1945, Mar. 1946, 2♀ (H. Sick, AMNH). *São Paulo:* Bosque da Saúde, 22 Mar. 1942, 1♂ (F. Lane, MZSP 10442); Boroceió, 18 Aug. 1966, 1 imm. (Exped. Depto. Zool., MZSP 5930); Cocaia, Imprensa Santa Amaro, Sept. 1941, 1♂ (MZSP 2451); 7 Oct. 1948, 4♀ (H. Urban, MZSP 9923); Sept. 1949, 5♀, 5 imm. (H. Urban, MZSP 7856); Eng. Marciac, 1♀ (P. Biasi, Leme, MZSP 6039); Represa, São Bernardo, 1♂ (MZSP 9605); 1♂ (MZSP 9575); Estr. do Mar, São Bernardo, 7 Feb. 1968, 7♀, 2 imm. (P. Biasi, MZSP 8208, 85217); Ilha São Sebastião, 23 Mar. 1951, 1♀ (H. Urban, MZSP 7217); Santos, 29 Jan. 1951, 1♂ (P. Biasi, MZSP 13152); Jardim Botânico, São Paulo, 9 Mar. 1955, 1♀ (H. L. Levi, MCZ). *Paraná:* Serra da Graciosa, Morretes, 9–20 Jan. 1995, 2♀ (Lab. Arachnol., MCP 6927); Cataratas do Iguaçu, 23–24 Mar. 1985, 1♀ (H. L. Levi, MCZ). *Santa Catarina:* Nova Teutônia, 27°11'S, 52°23'W, 1931, 1♀ (F. Plammann, SMF); 1 Feb. 1996, 1♂ (A. B. Bonaldo, MCN 27308). *Rio Grande do Sul:* Belém Novo, Porto Alegre, 11 Apr. 1981, 1♀ (A. A. Lise, MCN 9634); Parque Estadual de Caracol, 8 km de Canela, 24 June 1994, 1♀ (M. Ramirez, MACN); Carazinho, 10 Nov. 1979, 1♀ (H. Bischoff, MCN 8660); Floresta Nacional, Paço Fundo, 12 Oct. 1985, 2♀ (A. A. Lise, MCN 13631a); Guáiba, 29 Oct. 1994, 1♀ (A. A. Lise, MCP 5684a); Montenegro, 29 Sept. 1977, 1♀ (E. H. Buckup, MCN 6651a); 3 Nov. 1977, 1♂ (H. A. Gastal, MCN 7152); Pelotas, 31 Dec. 1996, 1♀ (L. Moura, MCN 28160); Rio Pardo, 10 Feb. 1966, 1♀ (A. A. Lise, MCN 0743); Viamão, 21 Dec. 1994, 1♀, 1♂ (MCP 5866); 6 May 1994, 1♀ (A. A. Lise, MCP 4682). *ARGENTINA Misiones:* Montecarlo, Jan. 1966, 4♀ (M. E. Galiano, MACN); Santa María, Oct. 1953, 2♀ (De Carlo, MACN 3590).

*Cyclosa machadinho* new species

Figures 265–274; Map 6C

*Holotype.* Female holotype, male allotype, three female and two male paratypes from Machadinho, Rio Grande do Sul, Brazil, 8–14 Feb. 1989 (A. B. Bonaldo), in MCN no. 18181, a pair of paratypes in MCZ. The specific name is a noun in apposition after the locality.

*Description.* Female holotype. Carapace yellow and brown (Fig. 267). Abdomen venter with black and white patches (Fig. 268). Abdomen with a pair of dorsal tubercles and a median posterior extension (Figs. 267–269) and a pair of ventral tubercles (Fig. 269). Total length 6.8 mm. Carapace 2.4 mm long, 1.8 wide in thoracic region, 1.0 wide behind posterior lateral eyes. First femur 2.3 mm, patella and tibia 2.5, metatarsus 1.4, tarsus 0.7. Second patella and tibia 2.2 mm, third 1.3, fourth 2.4. All femora shorter than corresponding patellae and tibiae.

Male allotype. Carapace brown, cephalic region of carapace lightest (Fig. 270). Abdomen with dorsal black marks (Fig. 270), venter black. Abdomen with posterior median extension and sometimes with anterior tubercles. Total length 3.1 mm. Carapace 1.65 mm long, 1.32 wide in thoracic region, 0.48 wide behind posterior lateral eyes. First femur 1.75 mm, patella and tibia 1.69, metatarsus 1.17, tarsus 0.53. Second femur 1.45 mm, patella and tibia 1.30. Third femur 0.94 mm, patella and tibia 0.78. Fourth femur 1.61 mm, patella and tibia 1.35. All femora longer than corresponding patellae and tibiae.

*Note.* Males and females were collected together.

*Variation.* Total length of females 5.5 to 8.3 mm, males 2.8 to 4.0. The illustrations were made from the female holotype and male allotype.

*Diagnosis.* Unlike all other *Cyclosa* species, *C. machadinho* has the openings in a circular depression facing anteriorly and showing as a loop on each side of the scape (Fig. 265). The male has a conductor notch with parallel sides (Fig. 272), as in *C. tapetifaciens* (Fig. 192), but wider, and

the median apophysis tooth is more bent than that of *C. tapetifaciens* (Fig. 194), almost pointing to the attachment of the median apophysis (Fig. 274).

*Distribution.* Southern Brazil, northern Argentina (Map 6C).

*Specimens Examined.* BRASIL *Rio de Janeiro:* Petrópolis, 3♀ (AMNH); Teresópolis, 1♀ (AMNH). *São Paulo:* Cocaia, 3♀, 1♂ (MZSP 4654, 9665); Estr. Santos Jurulotuba, 1♀ (MZSP 4704); Campos do Jordão, 1♂ (MZSP 9623); 2♂ (MZSP 13157); Jabaquara, Cidade São Paulo, 1♀ (AMNH); Jequirituba, Cidade São Paulo, 1♀ (AMNH); Guarulhos, 2♀ (MZSP 7299, 8340). *Paraná:* Estância Santa Clara, Guarapuava, 1♀ (MCN 17106); Rincão, 1♀ (MZSP 13156); Rolândia, 1♀ (AMNH); Refúgio Biológica de Santa Helena, Santa Helena, 1♂ (MCN 20637); Serra de Graciosa, Morretes, 1♀ (MCP 7035). *Santa Catarina:* Ilha João da Cunha, Porto Belo, 1♂ (MCP 1635); Volta Grande Concordeia, 1♀ (MCN 19559). *Rio Grande do Sul:* Área de Preservação, Ambiental Celulose, Cambará do Sul, 3♀ (MCN 25985); Cambará do Sul, 2♀ (MCN 24330); 1♀ (MCN 24570); Arvorezinha, 1♀ (MCP 3095); Bage, 6♀ (MCN 9956); Cachoeira do Sul, 1♀, 1♂ (MCN 6020, 6025, MCP 3443); 1♀, 5♂ (MCP 3425, 3426, 3443); Canela, 1♂ (MCN 10149); Canoas, 2♀ (MCN 0285); Fazenda Souza, Caxias, 3♀ (MCP 5323, 7311); Cerro Claro, São Pedro do Sul, 2♀ (MCN 12916); Erechim, Colégio Agrícola, 1♂ (MCN 19571); Erval Grande, 1♂ (MCP 4454); Estreito Augusto Cesar Marcelina Ramos, 1♀ (MCN 19541); Fazenda Coqueiro, Minas Do Leão, 1♀ (MCN 11450); Fazenda São Roque, 1♀ (MCN 11043); Floresta Nacional Passo Fundo, 5♀ (MCN 13631); Guaíba, 2♀ (MCP 5413, 5684); Itaimbenzinho, Cambará do Sul, 2♀ (MCN 12790, 13276); Montenegro, 6♀, 2♂ (MCN 6651, 6752, 7151, 7213, 7526); Novo Hamburgo, 1♂ (MCN 12716); Lomba do Pinheiro, Porto Alegre, 1♂ (MCN 18629); Paso Fundo, 1♂ (MCN 18938); Poço do Carvão, Campo Bom, 1♂ (MCN 8792); Jardim Botânico, Porto Alegre, 1♀ (MCZ); Quaraí, 2♀ (MCP 452); Reserva Florestal, Invernada do Butiá, Ronda Alta, 1♂ (MCN 16056); Santa Maria, 1♂ (MCN 15235); São Francisco de Paula, 2♀ (MCN 9513, MCP 4510); São Valentim, 2♂ (MCN 4789); Banhado das Freiras, São Leopoldo, 1♀ (MCN 27592); Sinodal, São Leopoldo, imm. (MZSP 7186); Parque de Turvo, Tenente Portela, 2♀, 3♂ (MCN 6651, 7213, 8969); Viamão, 1♀ (MCN 0632); Vila Oliva, 1♀ (MCN 00296). *PARAGUAY Boquerón:* Transchaco, km 640, 1♂ (IRSNB). *ARGENTINA Misiones:* San Antonio, 1♀ (MACN 3416); Santa Ana, 1♀ (MACN); Santa Maria, 2♀, 2♂ (MACN 3585); 2♀ (MACN 2917); Misiones, 1♀ (MACN 1526); Campamento Tobuma [26°28'S, 53°54'W], 1♀ (MACN); 1♀ (AMNH). *Buenos Aires:* Delta del Paraná, Angostura, 2♀ (MACN 1342); Escobar, 2♀ (MACN 2955); Ezeiza, 1♀ (MACN); Isla Martín García, 1♂ (MACN); Paraná de las Palmas,



Canal 6, 7 ♀ (M. E. Galiano, MACN); Tigre, 1 ♀ (MACN).

*Cyclosa triquetra* Simon  
Figures 275–283; Map 6D

*Cyclosa triquetra* Simon, 1895: 779, 782, 784, fig. 551, ♀. Female and male syntypes from Venezuela in MNHN, examined. Roewer, 1942: 760. Bonnet, 1956: 1324.

*Cyclosa clara* O. P.-Cambridge, 1898: 248, pl. 31, fig. 8, ♀. Ten female and several immature syntypes from Teapa, Tabasco, Mexico, examined. F. O. P.-Cambridge, 1904: 497, pl. 47, fig. 13, ♀. Roewer, 1942: 759. Bonnet, 1956: 1310. NEW SYNONYMY.

*Note.* As Simon notes behavioral observations, he probably collected specimens himself on his trip to Venezuela.

*Description.* Female from Costa Rica. Thoracic region of carapace dark brown grading into yellowish cephalic region (Fig. 277). Sternum dark brown with three distinct white patches. Abdomen venter black with a median white patch and adjacent lateral three pairs of white patches (Fig. 278). Abdomen with a pair of tubercles bearing nipples and a median posterior extension (Figs. 277, 279). Total length 3.6 mm. Carapace 1.25 mm long, 1.13 wide in thoracic region, 0.60 wide behind posterior lateral eyes. First femur 1.13 mm, patella and tibia 1.39, metatarsus 0.78, tarsus 0.49. Second patella and tibia 1.17 mm, third 0.65, fourth 1.17. First femora shorter than corresponding patellae and tibiae, second and fourth same length, third longer.

Male from Mala Valley, Peru. Coloration darker than in female, legs brown ringed. Abdomen venter black with one pair of white spots. Abdomen (Fig. 280) as in female. Total length 2.7 mm. Carapace 1.43 mm long, 1.13 wide in thoracic region,

0.48 wide behind posterior lateral eyes. First femur 1.24 mm, patella and tibia 1.32, metatarsus 0.73, tarsus 0.52. Second patella and tibia 1.13 mm, third 0.65, fourth 1.08. First and second femora shorter than corresponding patella and tibia, third and fourth of equal length.

*Variation.* Total length of females 2.9 to 4.8 mm, males 2.6 to 2.7. Illustrations were made from the female from Costa Rica, and the male from Peru.

*Diagnosis.* The female can be separated from all others by the shape of the abdomen, almost as long as wide, and by having nipples on the pair of dorsal tubercles (Figs. 277–279). The male has a short abdomen, as in the female, but the nipples are less distinct (Fig. 280). The median apophysis of the palpus has a minute tooth (Fig. 283).

*Natural History.* Specimens were collected in and around a house and in pasture near Cali, Colombia, and in an apple tree near Mala Valley, Peru. Many collecting sites were relatively dry areas. An egg sac from a Belize female contained only eight eggs.

*Distribution.* Mexico, Lesser Antilles to Peru and Venezuela (Map 6D).

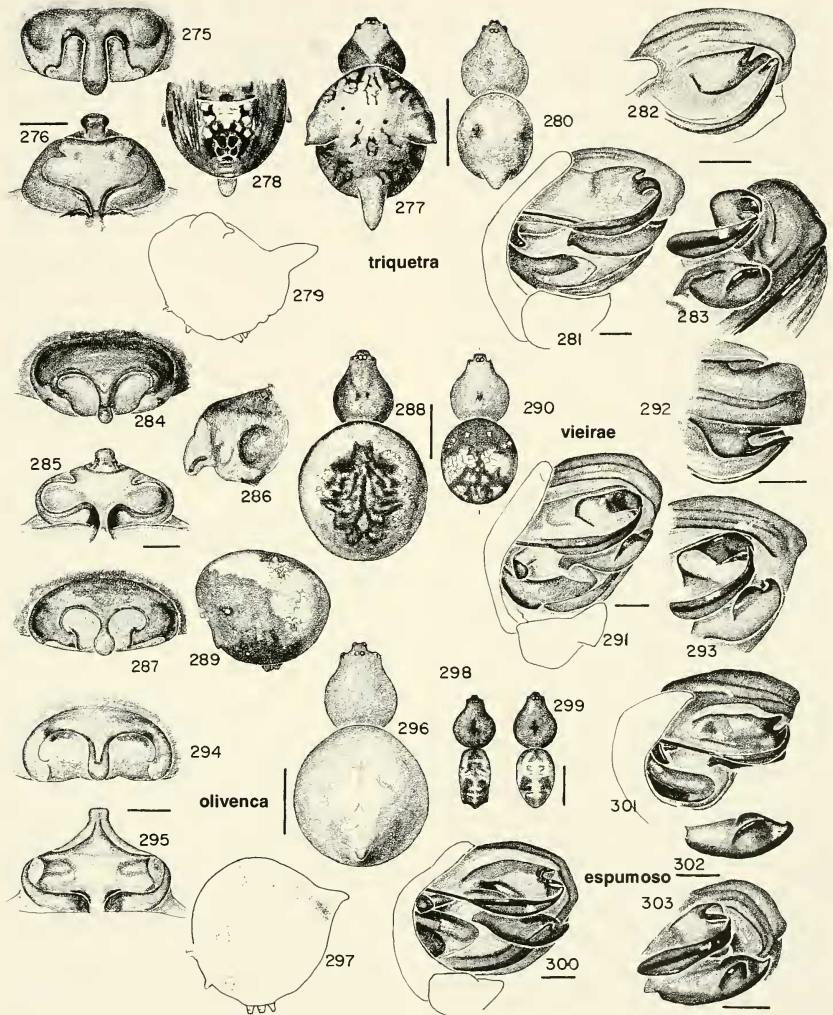
*Specimens Examined.* MEXICO *Tamaulipas:* Sierra de Tamaulipas, 900 m, 4–7 Aug. 1945, 1 ♀ (H. Wagner, AMNH). *Yucatan:* Chichen Itza, 16–18 Feb. 1939, 1 ♂ (AMNH). BELIZE *Stann Creek Distr.:* Twin Cays, 20 Mar. 1986, 1 ♀; Twin Cays, NW Point, 14 Mar. 1986, 2 ♀; Twin Cays, Hidden Lake, 19 Mar. 1986, 1 ♀ (all P. Sierwald, USNM). HONDURAS *Tela,* 26 July 1929, 1 ♀ (A. M. Chickering, MCZ). COSTA RICA *Guanacaste:* Tilarán, Dec. 1964, 1 ♀ (C. E. Valerio, MCZ).

LESSER ANTILLES *Guaadeloupe:* Pointe à Pitre, 10, 11 Jan. 1955, 1 ♀ (A. M. Nadler, AMNH). *St. Lucia:* Castries, Aug. 1976, 1 ♀ (N. L. H. Krauss,

Figures 275–283. *C. triquetra* Simon. 275–279, female. 275, 276, epigynum. 275, ventral. 276, posterior. 277, dorsal. 278, abdomen, ventral. 279, abdomen lateral. 280–283, male. 280, dorsal. 281–283, left palpus. 281, mesal. 282, apical. 283, median apophysis.

Figures 284–293. *C. vieirae* n. sp. 284–289, female. 284–287, epigynum. 284, 287, ventral. 285, posterior. 286, lateral. 284–286, (N of Manaus). 287, (Manaus). 288, dorsal. 289, abdomen lateral. 290–293, male. 290, dorsal. 291–293, palpus. 291, mesal. 292, apical. 293, median apophysis.





Figures 294-297. *C. olivenca* n. sp., female. 294, 295, epigynum. 294, ventral. 295, posterior. 296, dorsal. 297, abdomen lateral.

Figures 298-303. *C. espumoso*, n. sp., male. 298, 299, dorsal. 298, (Salto do Jacuí, Rio Grande do Sul). 299, (Espumosa, Rio Grande do Sul). 301-303, left palpus. 300, mesal. 301, apical. 302, 303, median apophysis.

Scale lines: 1.0 mm; genitalia 0.1 mm.

AMNH). *Trinidad*: Bayshore, 2 Sept. 1968. 1♀ (R. Jamison, AMNH).

VENEZUELA *Aragua*: Maracay, 15 Feb. 1954. 1♀ (A. M. Nadler, AMNH). COLOMBIA *Córdoba*: Aypapel, nr. Ciénaga La Cuajada, 5 Jan. 1957. 1♀ (M. A. Serna, MCZ). *Boyacá*: Muzo, 1936. 2♀ (J. Bequaert, MCZ). *Cundinamarca*: Finca Bella Vista nr. Sasaima, 13–24 May 1965. 3♀ (P. R., D. L. Craig, CAS). *Valle*: nr. Cali, 1,000 m. 25 Feb. 1973. 1♀, 1 imm.; 1 Mar. 1973. 1♀ (H. Levi, MCZ); June 1973. 1♀ (W. Eberhard, 529); Río Vanca nr. Cali, 23 June 1970. 1♀ (W. Eberhard 261, MCZ); Río Cauca nr. Cali, 15 June 1970. 1♀ (W. Eberhard 260, MCZ); Calima, Lago betw. Buga and Loboquerrero, Sept. 1973. 1♀ (W. Eberhard, MCZ). PERU *Piura*: Quebrada Mogollón, 30 Apr. 1939. 1♀; 18 June 1939. 1♀; 16 July 1939. 3♀; 24 Sept. 1939. 1♀; Piura Songora, 20 Apr. 1941. 1♀; Paríñas Valley, 7 May 1939. 2♀, 1♂; 21 May 1939. 1♀; Cerra Negro, 15 June 1951. 12 ♀, 4 imm. (all D. L., H. E. Frizzell, CAS). *Lima*: Mala Valley, May 1964. 11♀, 7♂ (CAS).

### *Cyclosa vieirae* new species Figures 284–293; Map 3B

*Holotype*. Female holotype from Cabo Frio Reserve, 80 km N Manaus, Est. Amazonas, Brazil, 22 Nov. 1959 (H. Fowler, E. Venticinque, R. S. Vieira), in MCN. The species is named after one of the collectors.

*Description*. Female holotype. Carapace brown (Fig. 288). Sternum brown. Abdomen with white spots and dark marks, sides dark anteriorly (Figs. 288, 289); venter evenly black, gray anteriorly, with two pairs of white spots, one on each side of pedicel and one on each side in center (Fig. 289). Abdomen spherical in dorsal view without tubercles or posterior extension (Figs. 288, 289). Total length 3.8 mm. Carapace 1.49 mm long, 1.17 wide in thoracic region, 0.57 wide behind posterior lateral eyes. First femur 1.17 mm, patella and tibia 1.33, metatarsus 0.68, tarsus 0.40. Second patella and tibia 1.17 mm, third 0.74, fourth 1.24. All femora shorter than corresponding patellae and tibiae.

Male allotype. Coloration darker than in female. Dorsum of abdomen black anteriorly and posteriorly with white pigment spots between; outline of black areas irregular (Fig. 290); venter as in female. Abdomen (Fig. 290) shape as in female. Total length 3.0 mm. Carapace 1.75 mm long, 1.30 wide in thoracic region, 0.51 wide be-

hind posterior lateral eyes. First femur 1.69 mm, patella and tibia 1.50, metatarsus 1.05, tarsus 0.52. Second patella and tibia 1.16 mm, third 0.73, fourth 1.43. All femora slightly longer than corresponding patellae and tibiae.

*Note*. Males and females were collected at the same locality, and the spherical abdomen of the male matches that of the female.

*Variation*. Total length of females 2.6 to 4.2 mm, males 2.7 to 3.0. The illustrations were made from the female holotype and male allotype.

*Diagnosis*. With its unusual spherical abdomen and dark sides anteriorly, the species could easily be misplaced in *Metazygia*. It is distinguished by its *Cyclosa*-like genitalia, both epigynum (Figs. 284–287) and palpus (Figs. 291–293).

*Distribution*. Amazon area (Map 3B).

*Specimens Examined*. PERU *Loreto*: Jenaro Herrera, 04°55'S, 73°45'W, 25 Aug. 1958. 1♀ (D. Silva, MUSM). BRASIL *Amazonas*: 80 km N Manaus, 2°24'S, 59°52'W, 22 Aug. 1959. 2♂, one marked allotype, the other paratype (H. G. Fowler, MCN, MCZ); Cabo Frio Reserve, 6 Sept. 1959. 1♀; 14 Jan. 1990. 2♀ (H. Fowler, E. Venticinque, R. S. Vieira, MCZ); 14 Jan. 1990. 2♀ (H. Fowler, E. Venticinque, R. S. Vieira, MCZ); Manaus, Aug. 1971. 1♀ (M. E. Galiano, MACN); Manaus, Reserva Ducke, Aug. 1971. 1♀ (M. E. Galiano, MACN); São Paulo Olivença, 2♀ (M. de Mathan, MNHN 9389).

### *Cyclosa olivenca* new species Figures 294–297; Map 6B

*Holotype*. Female holotype from São Paulo de Olivença, Amazonas State, Brazil, pre-1850 (M. de Mathan), in MNHN. The specific name is a noun in apposition after the locality.

*Note*. Simon recognized the specimen as a *Cyclosa* but did not describe it.

*Description*. Female holotype with color faded. Prosoma yellow (Fig. 296), distal leg articles indistinctly ringed. Abdomen whitish with indistinct dorsal white folium, lateral white patches and a pair of ventral white pigment patches (Figs. 296, 297). Abdomen spherical with one median, posterior, dorsal tubercle (Figs. 296, 297). Total length 3.6 mm. Carapace 1.30 mm

long, 1.05 wide in thoracic region, 0.73 wide behind posterior lateral eyes. First femur 1.30 mm, patella and tibia 1.30, metatarsus 0.80, tarsus 0.55. Second patella and tibia 1.14 mm, third 0.74, fourth 1.17. Length of femora about same as corresponding patellae and tibiae.

**Diagnosis.** The abdomen of the female is spherical with a median, posterior tubercle (Fig. 296, 297). It resembles the abdomen of some female theridiids of the genus *Achaearanea* and is unlike any other *Cyclosa* species. However, it has the typical *Cyclosa* epigynum.

**Distribution.** Known only from the Amazon near the Peruvian border (Map 6D). No other specimens were found.

#### *Cyclosa espumoso* new species

Figures 298–303; Map 5B

**Holotype.** Male holotype from Salto de Jacuí, Espumoso, Rio Grande do Sul, Brazil, 14 Jan. 1982 (A. A. Lise), in MCN no. 9986. The specific name is a noun in apposition after the locality.

**Description.** Male holotype. Carapace dark brown (Figs. 298, 299). Sternum dark. Abdomen white with dorsal symmetrical dark patches (Figs. 298, 299); venter black. Abdomen with a median posterior point and two posterior tubercles (Figs. 298, 299). Total length 2.9 mm. Carapace 1.53 mm long, 1.13 wide in thoracic region, 0.44 wide behind posterior lateral eyes. First femur 1.12 mm, patella and tibia 1.29, metatarsus 0.78, tarsus 0.48. Second patella and tibia 1.08 mm, third 0.65, fourth 1.14.

**Note.** The male from Pelotas was collected with the female *C. morretes*, but *C. espumoso* is probably the male of *C. vi-cente*.

**Variation.** Total length of males 2.7 to 3.2 mm. Figures 298, 302 illustrate the holotype; Figures 299, 300, 301, 303 are the male from Tenente Portela.

**Diagnosis.** This male is distinguished from others by the small conductor notch with parallel sides in apical view (Fig. 301) and the asymmetrical median apophysis

lobe and its distance from the tooth (Figs. 302, 303).

**Distribution.** Southern Brazil (Map 5B).

**Specimens Examined.** BRAZIL *São Paulo*: Jundiá, Oct. 1976, 1♂ (A. Schneble, MCZ). *Rio Grande do Sul*: Machadinho, 8–14 Feb. 1989, 1♂ (A. B. Bonaldo, MCN 18182); Pelotas, 31 Dec. 1996, 1♂ (L. Moura, MCN 25160); Tenente Portela, 29 Nov. 1978, 2♂ (H. Bischoff, MCN 8438).

#### *Cyclosa monteverde* new species

Figures 304–313; Map 6B

**Holotype.** Female holotype and one female paratype from Monteverde, Guanacaste Prov., Costa Rica, Jan. 1980 (W. Eberhard, 2103), in MCZ. The specific name is a noun in apposition after the locality.

**Note.** The type and some other specimens are labeled as coming from Guanacaste Province, but Monteverde is in Puntarenas, close to the border with Guanacaste.

**Description.** Female holotype. Carapace dark brown, cephalic region yellowish (Fig. 306). Abdomen venter black, black around spinnerets (Fig. 307). Abdomen with a pair of anterior tubercles and a median posterior extension (Figs. 306–308). Total length 5.2 mm. Carapace 1.6 mm long, 1.2 wide in thoracic region, 0.6 wide behind posterior lateral eyes. First femur 1.52 mm, patella and tibia 1.69, metatarsus 0.84, tarsus 0.45. Second patella and tibia 1.43 mm, third 0.8, fourth 1.4. First femora shorter than corresponding patellae and tibiae, others same length.

Male from Cerro Punta, Panama. Pro-soma orange, sternum dusky orange. Abdomen black with white patches (Fig. 309), venter black with one pair of white patches. Abdomen as in female, tubercles less distinct (Fig. 309). Total length 2.4 mm. Carapace 1.30 mm long, 1.07 wide in thoracic region, 0.40 wide behind posterior lateral eyes. First femur 1.17 mm, patella and tibia 1.26, metatarsus 0.68, tarsus 0.36. Second patella and tibia 0.99 mm, third 0.54, fourth 0.92.

**Note.** A male was collected with females at Cerro Punta, Panama.

**Variation.** Total length of females 3.8 to

5.2 mm. The illustrations were made from the female holotype and the male from Cerro Punta.

**Diagnosis.** *Cyclosa monteverde* has the body shape of *C. turbinata*, except that the posterior end of the abdomen is narrower (Figs. 306, 308). The epigynum differs from that of *C. turbinata* (Fig. 314) by having a narrower scape; each side of the epigynum could be covered by three or more widths of the scape (Fig. 304), whereas in *C. turbinata*, each side of the epigynum could be covered by only two widths of the scape (Fig. 314). The median apophysis of the *C. monteverde* palpus differs by having a distinct, distal keel and a more proximal tooth on the median apophysis (Figs. 312, 313), whereas in *C. turbinata*, the keel fades out toward the tooth (Fig. 321).

**Distribution.** Costa Rica and western Panama (Map 6B).

**Paratypes.** COSTA RICA *Puntarenas*: Monteverde, 13 Oct. 1961, 22♀ (C. W. Parker, AMNH); Jan 1980, 4♀ (W. Eberhard 2100–2102, 2104, MCZ);

**Specimens Examined.** COSTA RICA *Puntarenas*: Monteverde, 1,500 m, Jan. 1983, 1♀ (W. Eberhard, MCZ); Monteverde Community, San Luis Road, 1,450 m, 29 Nov. 1976, 1♀ (C. L. Craig, MCZ). *Sau José*: Cerro de Escazú, 1,500 m, Oct. 1987, 1♀ (W. Eberhard SA4 105, MCZ); Río Hondura, 1,200 m, Nov. 1987, 1♀ (W. Eberhard SAE-233, MCZ). *Cartago*: Cartago, 4♀ (N. Banks, MCZ). PANAMA *Chiriquí*: Cerro Punta, 4 Mar. 1936, 14♀, 1♂; El Volcán, 28 Feb. 1936, 1♀ (both W. J. Gertsch, AMNH).

### *Cyclosa turbinata* (Walckenaer)

Figures 314–321; Map 6A

*Epeira turbinata* Walckenaer, 1841: 140. Description of female figures 79, 80 from Georgia in Abbot's Georgia Spiders manuscript kept in BMNH. Copy of manuscript in MCZ, examined.

*Epeira caudata* Hentz, 1850: 23, pl. 3, fig. 14, ♀. Female types from the USA in the Boston Natural History Museum, destroyed. First synonymized by McCook 1894: 224.

*Cyclosa index* O. P.-Cambridge, 1889: 51, pl. 6, fig. 6, ♀. Female holotype from Tamalú, Guatemala in BMNH, examined. F. P.-Cambridge, 1904: 496, pl. 47, fig. 12, ♀. First synonymized by Levi (1977).

*Cyclosa turbinata*:—McCook, 1894: 224, pl. 17, figs. 5, 6, ♀, ♂. Petrunkevitch, 1911: 334. Roewer, 1942: 761. Bonnet, 1956: 1325. Levi, 1977: 80, pl. 2, figs. 20, 38–50, map 2.

*Cyclosa caudata*:—Keyserling, 1893: 279, pl. 14, fig. 206, ♀, ♂.

*Cyclosa culta* O. P.-Cambridge, 1893: 112, pl. 14, fig. 12, ♂. Two male syntypes, both with left palpus lost in 1997, from Omilteme, Guerrero, Mexico, in BMNH, nos. 1905.4.28.2844–5, examined. F. P.-Cambridge, 1904: 493, pl. 47, fig. 2, ♂. First synonymized by Levi (1977).

*Cyclosa tuberculifera* O. P.-Cambridge, 1898: 269, pl. 36, fig. 10, ♂. Male holotype without palpi from Teapa, Tabasco, Mexico, in BMNH, no. 1905.4.28.2843, examined. F. P.-Cambridge, 1904: 493, pl. 47, fig. 1, ♂. Roewer, 1942: 761. Bonnet, 1956: 1325. Doubtful synonymy by Levi (1977).

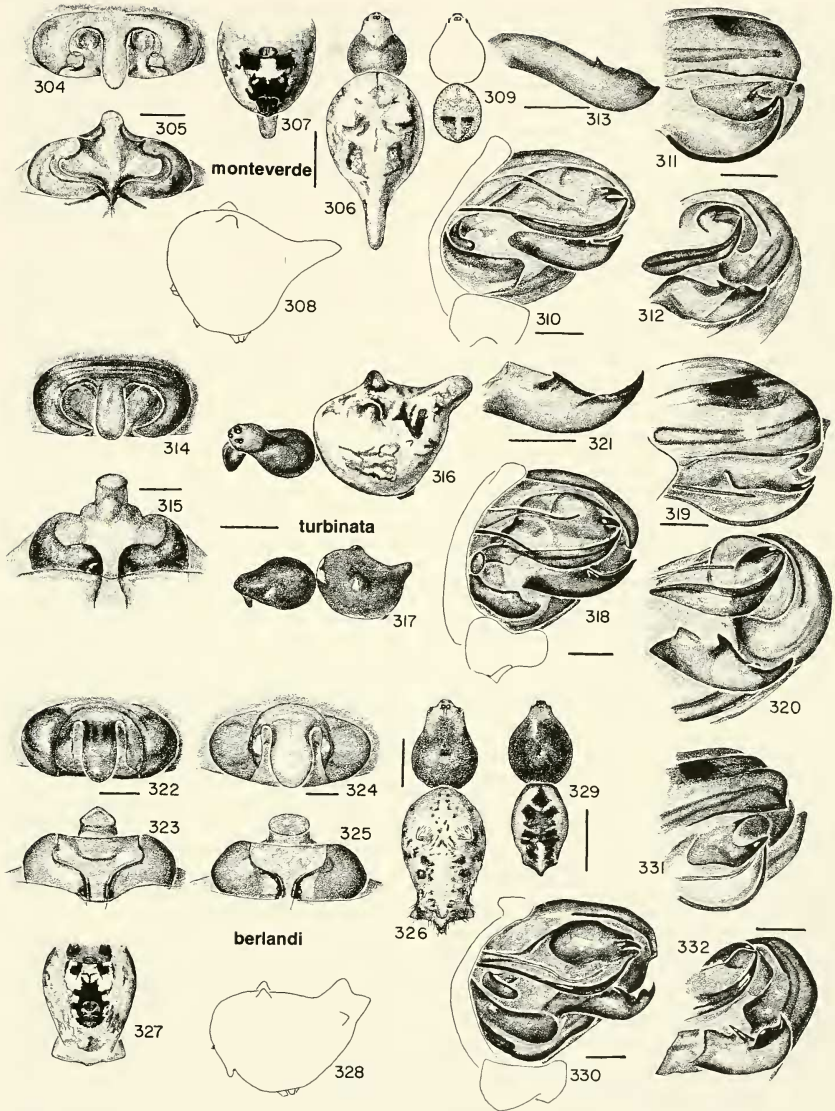
**Description.** Female from Isla Raza, Gulf of California. Carapace dark brown grading into yellowish cephalic region (Fig. 316). Abdomen venter black with three pairs of white patches, the median pair largest. Abdomen with a pair of humps and a median posterior extension (Fig. 316). Total length 4.4 mm. Carapace 1.6 mm long, 1.2 wide in thoracic region, 0.6 wide behind posterior lateral eyes. First femur 1.4 mm, patella and tibia 1.6, metatarsus 0.9, tarsus 0.4. Second patella and tibia 1.4 mm, third 0.9, fourth 1.4. Femora shorter than corresponding patellae and tibiae, except third, which is longer.

Male from Isla Raza, Gulf of California. Coloration much darker than in female. Abdomen black with three white patches dorsally; venter black with one pair of white patches (Fig. 317). Abdomen (Fig. 317) as in female. Total length 3.2 mm. Carapace 1.60 mm long, 1.20 wide in thoracic region, 0.47 wide behind posterior

Figures 304–313. *Cyclosa monteverde* n. sp. 304–308, female. 304, 305, epigynum. 304, ventral. 305, posterior. 306, dorsal. 307, abdomen, ventral. 308, abdomen, lateral. 309–313, male. 309, dorsal. 310–313, left palpus. 310, mesal. 311, apical. 312, 313, median apophysis.

Figures 314–321. *C. turbinata* (Walckenaer). 314–316, female. 314, 315, epigynum. 314, ventral. 315, posterior. 316, sublateral. 317–321, male. 217, sublateral. 318–321, palpus. 318, mesal. 319, apical. 320, 321, median apophysis.





Figures 322-332. *C. berlandi* n. sp. 322-328, female. 322-325, epigynum. 322, 324, ventral. 323, 325, posterior. 322, 323, (Mexico). 324, 325, (Ecuador). 326, dorsal. 327, abdomen, ventral. 328, abdomen, lateral. 329-332, male. 329, dorsal. 330-332, palpus. 330, mesal. 331, apical. 332, median apophysis.

Scale lines: 1.0 mm; genitalia 0.1 mm.



lateral eyes. First femur 1.47 mm, patella and tibia 1.43, metatarsus 0.74, tarsus 0.44. Second patella and tibia 1.17 mm, third 0.73, fourth 1.24. All femora slightly longer than corresponding patella and tibia.

*Note.* Males and females were collected together.

*Variation.* Total length of females 3.6 to 5.0 mm, males 2.5 to 3.6. Some females lack humps. The illustrations were made from female specimens from Isla Raza, and the male from Venado Arroyo [Mexican locality not located].

*Diagnosis.* The shape of the abdomen separates this species from *C. walckenaeri* (Fig. 337) and the epigynum has a wider scape (Fig. 314) than that of *C. monte-verde* (Fig. 304). The palpus of the male (Figs. 318–321) is similar to that of *C. walckenaeri* (Figs. 340–342), but the shape of the abdomen (Fig. 317) usually differs.

*Natural History.* Specimens have been found on mangroves in Baja California, tidepool beach in Sonora.

*Distribution.* From New England and Washington State south to Panama, Bermuda, Greater Antilles and Galapagos (Map 6A).

*Specimens Examined.* BERMUDA July 1904, 7♀, 1♂ (J. Kincaid, CAS); Dyer Island, 25 June 1918, 2♀, 1♂ (MCZ); Grasmere, 10 July–4 Aug. 1921, 2♂ (E. B. Bryant, MCZ).

MÉXICO Venado Arroyo [?], 27 July 1934, 1♂ (MCZ). *Chihuahua:* Matachic, 6 July 1947, 1♀ (W. J. Gertsch, AMNH). *Nuevo León:* Horsetail Falls, San Juan River Canyon, 1 Aug. 1968, 1♀ (J. E. Carico, USNM). *Chihuahua:* Creel, 27°45'N, 107°35'W, 6 July 1991, 2♀ (W. H. Piel, G. S. Bodner, MCZ). *Sonora:* 15 to 20 km E Brevicora, 29°43'N, 110°05'W, 6 Aug. 1983, 1♀ (V. B. Roth, CAS); Puerto Kino, Dec. 1963, 1♀ (W. Eberhard, MCZ); S Puerto Libertad, 4 Nov. 1983, 1♀, 3♂ (V. Roth, CAS); Topaca Bay, 29 Apr. 1921, 3♀ (J. C. Chamberlin, MCZ); El Coyote, 28 km E Río Bavispe, 20 July 1980, 1♂ (J. A. Beatty, AMNH). *Baja California Norte:* Isla Partida, 22 Apr. 1921, 1♀; 1 July 1921, 4♀ (both J. C. Chamberlin, MCZ); 24 km S Punta Prieta, 7 July 1973, 1♀ (S. C. Williams, K. B. Blair, CAS); Rancho Las Parritas, 16 km S. San Quintin, 27, 28 June 1977, 4♀ (C. E. Griswold, CAS); Isla Raza, 21 April 1921, 4♀, 1♂ (J. C. Chamberlin, MCZ); May to July 1921, 2♀ (J. C. Chamberlin, CAS); Isla Partida, 1 July 1921, 6♀ (J. C. Chamberlin, CAS). *Baja California Sur:* 50 km S La Laguna, 30 June 1968, 1♂ (H. Bentzen,

CAS); Santiago, 18 Mar. 1944, 1♂ (AMNH); La Paz, 12 Apr. 1921, 1♀ (J. C. Chamberlin, MCZ); 8 km S Miraflores, road to Las Casitas, 15 Dec. 1977, 1♀ (L. Vincent, C. E. Griswold, CAS); Aldefano Isl., 17, 18 May 1921, 1♀, 1♂ (J. C. Chamberlin, MCZ); Las Galnas Island, 14 June 1921, 2♀ (J. C. Chamberlin, MCZ); Santa Lucy Isl., 13 May 1921, 2♀ (J. C. Chamberlin, MCZ). *San Luis Potosí:* 46 km S Huizache, 4 July 1985, 1♂ (J. B. Woolley, G. Zolnerowich, AD); 3 km W Pilares, 21°55'N, 100°48'W, 21 Oct. 1994, 1♀ (W. H. Piel, MCZ). *Durango:* Palos Colorados, 2,400 m, 5 Aug. 1947, 6♀ (W. J. Gertsch, AMNH); Otinapa, 2,500 m, 12 Aug. 1947, 1♀ (W. J. Gertsch, AMNH). *Jalisco:* 11 km S Mazamitla, 1 Dec. 1948, 1♀ (H. B. Leech, CAS). *Puebla:* Ihuachinango, 7 Oct. 1947, 1♂ (H. M. Wagner, AMNH); 6 km S Zacapoaxtla, 23 July 1985, 2♂ (J. Woolley, AD). *Guerrero:* 8 km SW Filo de Ceballos, 17 July 1984, 1♂ (J. B. Woolley, AD). *Yucatan:* 12 km S Mima on Highway 261, 20°24'N, 89°48'W, 21 July 1983, 1♂ (W. Maddison, MCZ). *COSTA RICA Cartago:* Cartago, 4♀ (Tristram, MCZ). *PANAMA Chiriqué:* Boquete, July 1939, 1♀; Aug. 1950, 4♀ (A. M. Chickering, MCZ); El Volcán, Aug. 1950, 2♀ (A. M. Chickering, MCZ).

CUBA *Havana:* Santiago de las Vegas, Apr. 1967, 2♀ (P. Aloyo, MCZ). *Pinar del Río:* Pinar del Río, 1♂ (J. Caraboa, MCZ). *HAITI* 32 km NW of Las Cayes, Les Platons, 750 m, July 1972, 1♀ (T. Moermond, MCZ); Las Cayes, Les Platons, Nov. 1971, 1♀ (T. Moermond, MCZ). *LESSER ANTILLES St. Kitts:* Windfield River, 30 May 1927, 2♀ (Roys, MCZ).

GALAPAGOS ISLANDS 15 May 1899, 2♀ (AMNH); Champion Isl., 1♀, (Y. Lubin, MCZ); Española Isl., 5 June 1983, 1♀ (Y. Lubin, MCZ); Fernandina Isl., 3 km inland, 25–27 Mar. 1970, 1♂ (R. Silberglied, MCZ); Cabo Hammond, Fernandina Isl., 15 Oct. 1982, 3♀, 3♂ (Y. Lubin, MCZ); Santa Cruz Island, 21 Apr. 1981, 1♂ (Y. Lubin, MCZ); S coast, Santa Fé Isl., 28 Jan. 1983, 1♀ (Y. Lubin, MCZ); SE Los Guayabiles, Santiago Isl., 15–20 Mar. 1983, 1♂ (Y. Lubin, MCZ); Albomarle, 2 Feb. 1899, 3♀ (AMNH); 14 Feb. 1899, 6♀ (AMNH); 13 Feb. 1899, 1♂ (AMNH); Lagus Cove, 13 Jan. 1899, 3♂ (AMNH); Narborough, 7 Apr. 1899, 1♀ (AMNH).

### *Cyclosa berlandi* new name Figures 322–332; Map 7B

*Holotype.* Female neotype and male from 20 km N Cuenca, 2,200 m, Ecuador (L. Peña), in MCZ.

*Cyclosa trituberculata* Berland, 1913: 91, pl. 9, figs. 36–41. ♂. Male holotype from Pinllar, Ecuador, lost. *Cyclosa trituberculata* is a homonym of a name by Lucas, described as *Epeira trituberculata* Lucas, 1846: 248. The Lucas name was placed in *Cyclosa* by Simon, 1874: 43.

*Note.* Berland described spiders from the mountains of Ecuador, illustrated the abdomen of the male, with three posterior

tubercles and a nondiagnostic view of the male palpus. As there is only one common species in the area with trifurcated abdomen in males; the identification is easy. The locality Pinllar has disappeared from recent gazetteers; it is northwest of 0°, 78°W (American Geographical Society, 1944).

The Lucas name *Cyclosa trituberculata* has been synonymized with *C. insulana* (Costa) (Roewer, 1942: 755).

**Description.** Female neotype. Carapace dark brown, cephalic region yellowish (Fig. 326). Abdomen (Fig. 326); venter black around spinnerets with white patches between epigynum and spinnerets (Fig. 327). Abdomen with six tubercles (Figs. 326–328). Total length 4.2 mm. Carapace 1.7 mm long, 1.1 wide in thoracic region, 0.7 wide behind posterior lateral eyes. First femur 1.4 mm, patella and tibia 1.6, metatarsus 0.9, tarsus 0.5. Second patella and tibia 1.4 mm, third 0.7, fourth 1.4. Femora of second and fourth legs same length as corresponding patellae and tibiae, third slightly longer.

Male collected with neotype. Coloration as in female. Dorsum of abdomen with contrasting markings (Fig. 329), venter black with one pair of white patches. Abdomen with three posterior tubercles (Fig. 329). Total length 3.0 mm. Carapace 1.56 mm long, 1.20 wide in thoracic region, 0.44 wide behind posterior lateral eyes. First femur 1.43 mm, patella and tibia 1.33, metatarsus 0.81, tarsus 0.48. Second patella and tibia 1.11 mm, third 0.66, fourth 1.08. All femora are longer than corresponding patellae and tibiae.

**Note.** Males and females were collected together.

**Variation.** Total length of North and Central American females 4.3 to 6.5 mm, males 2.8 to 3.9. Total length of South American females 4.2 to 6.0 mm, males 2.8 to 3.8. There is some doubt that the North American specimens are the same species as those from Colombia and Ecuador. Figures 322, 323, 327, 328 illustrate a female from Mexico; Figures 324, 325 the female neotype; Figure 326 from

northern Colombia; Figure 330 from Mexico; Figures 329, 331, 332 a male from Ecuador.

**Diagnosis.** The female has a wider, shorter scape (Fig. 322) and a smaller posterior median plate (Figs. 323, 325) than *C. walckenaeri* (Figs. 334, 336). The male differs by having a lobe and tooth on the median apophysis (Figs. 330, 332), whereas *C. walckenaeri* has a keel (Figs. 340, 343).

**Distribution.** The distribution is California, Texas, Mexico, Central America to Ecuador and Hispaniola (Map 7B). In 1977 I confused specimens of this species with the similar *C. walckenaeri*. Records of *C. walckenaeri* from California (Levi, 1977) are actually for this species.

**Specimens Examined.** UNITED STATES *Texas:* Big Bend National Park: Chisos Mountains, 28 Sept. 1950, 1♀ (W. J. Gertsch, AMNH). *California:* Monterey Co.: Carmel, Sept.–Oct. 1945, 1♀ (A. F. Archer, AMNH); Monterey, Aug., Sept. 1945, 11♀, 1♂ (A. F. Archer, AMNH); Del Monte Forest, 2.3 km S Pacific Grove, 8 Oct. 1945, 1♀ (A. F. Archer, AMNH). *Santa Cruz Co.:* Felton, St. Cruz Mts, 22 May 1907, 1♂ (J. C. Bradley, AMNH). *San Luis Obispo Co.:* Cambria, 29 June 1957, 1♀ (J. G. Edwards, MCZ). MEXICO *Aroyo Venado* [?], 27 July 1934, 4♀, 1♂ (MCZ). *Nuevo León:* Chapinque nr. Monterrey, 7 Apr. 1946, 1♀, 1♂ (A. M., L. I. Davis, AMNH). *Coahuila:* 14 km N Saltillo, 24 May 1952, 1♂ (M. Cazier et al., AMNH). *Chihuahua:* Madera, 5 July 1947, 2♀ (W. J. Gertsch, AMNH); Pelayo, 100 km W Santa Barbara, 20 July 1947, 1♀ (W. J. Gertsch, AMNH). *Sonora:* 24 km S Navajo, 8 Apr. 1979, 1♂ (D. G. Denning, AMNH). *Baja California Sur:* 12 km W Santiago, Rancho Mata Gordá, 18 Dec. 1977, 1♀ (C. Griswold, L. Vincent, CAS). *San Luis Potosí:* Tamazunchale, 19 Apr. 1963, 1♀ (W. J. Gertsch, W. Ivie, AMNH); 4.5 km E San Francisco, Rt. 70, 26 May 1982, 1♀ (F. Coyle, MCZ). *Zacatecas:* Guadalupe, 16 Aug. 1947, 1♂ (W. J. Gertsch, AMNH); E Guadalupe, 21 Aug. 1959, 4♀, 1♂ (A. F. Archer, AMNH). *Durango:* Palos Colorados, 2,600 m, 5 Aug. 1947, 2♀ (W. J. Gertsch, AMNH). *Quercetara:* 3.2 km E Final de Amoles, Rt. 120, 27 May 1982, 1♀ (F. Coyle, MCZ). *Guanajuato:* 3.2 km W Dolores, Hidalgo, 5 July 1985, 1♂ (J. Woolley, G. Zolnerowich, AD 85/026); 48 km NE León Guanajuato, 10 km SE Silco, 20°52'N, 101°21'W, 6 Sept. 1964, 1♀ (J., W. Ivie, AMNH). *Jalisco:* 19 km, S Mazamitla, 5 Dec. 1948, 1♂ (E. S. Ross CAS); 4.8 km S Mazamitla, 10 May 1963, 1♀, 2♂ (W. J. Gertsch, W. Ivie, AMNH). *Veracruz:* 25 km W Jalapa, 29 July 1955, 3♀, 2♂ (C. P. Vaurie, AMNH); 24 km W Jalapa, 23 June, 3♀ (A. M., L. I. Davis, AMNH);

Perote, 29 July 1955, 3♀, 2♂ (C., P. Vaurie, AMNH); Orizaba, 1♂ (Crawford Coll, MCZ). *Hidalgo*: Alfajayucan, Ixmiquilpan, 22 Aug. 1947, 1♂ (H. Wagner, AMNH); Apulco, 6 Oct. 1947, 1♀ (H. M. Wagner, AMNH); Ixmiquilpan, 15 Aug. 1947, 1♀, 1♂ (H. Wagner, AMNH); Tenango, 5 Oct. 1947, 5♀ (H. M. Wagner, AMNH). *México*: Tenancingo, 7–11 Sept. 1946, 1♀ (H. M. Wagner, AMNH); San Juan Teotihuacan, 3 July 1941, 1♀ (L. I. Davis, AMNH). *Michoacán*: mountains above Morelia, 24 Aug. 1958, 1♀ (A. F. Archer, MCZ); Tepetates Pass, 24 km W Hidalgo, 8 May 1963, 1♀, 2♂ (W. J. Gertsch, W. Ivie, AMNH). *Puebla*: 8 km SE Izucar de Matamoros, 20 July 1984, 1♂ (J. B. Woolley, MCZ); Tehuacan, 17–24 Oct. 1944, 1♀ (H. Wagner, AMNH); Chohila, 1975, 1♀ (A. F. Archer, AMNH). *Moravos*: Cuernavaca, Oct. 1944, 1♀ (N. L. H. Krauss, AMNH). *Guerrero*: W Chilapa, 16 July 1984, 1♂ (J. Woolley, AD 54/036). *Oaxaca*: Huajuapán, 27 Sept.–1 Oct. 1946, 1♂ (H. Wagner, AMNH); S Balt. Chichicapan, 4 Aug. 1991, 1♀ (W. H. Piel, G. S. Bodner, MCZ); 6 mi NE Mitla, 20 July 1985, 1♂ (J. Woolley, G. Zolnerowich, AD 85/077); Huamatlan, July 1981, 1♀ (G. Gold, CAS). *Tabasco*: coast, July 1981, 1♀ (G. Gold, CAS). *Chiapas*: San Cristobal de las Casas, 22 July 1947, 1♂ (C. M. Goodnight, AMNH); 11 Sept. 1947, 7♀, 2♂; 13 Sept. 1947, 2♀, 1♂ (H. Wagner, AMNH); 31 Dec. 1974, 3♀ (P. R. Craig, D. Green, CAS); 8 km W San Cristobal, 16°45'N, 92°41'W, 24 Aug. 1966, 2♀ (J. W. Ivie, AMNH). GUATEMALA: Chichicastenango, 6, 7 Aug. 1947, 2♂ (C., P. Vaurie, AMNH); Ciudad Guatemala, 20 Aug. 1947, 1♀ (B. Malkin, AMNH); Nebaj, 9, 10 Aug. 1947, 1♂ (C., P. Vaurie, AMNH). COSTA RICA: Chirral Paraiso [?], 1♀ (Biollev and Tristan, MCZ). San José: Cerro de Esecazú, 1,500 m, Oct. 1987, 1♀ (W. Eberhard, MCZ). PANAMA: Chiriqué: Boquete, July 1939, 2♀, 1♂; 4–11 Aug. 1954, 3♀, 1♂ (A. M. Chickering, MCZ); El Volcán, 9–14 Aug. 1950, 1♀, 1♂ (A. M. Chickering, MCZ).

HISPANIOLA: *Santa Domingo*: La Altigracia, Punta Cana, Isla Saona, 24 July 1992, 1♀ (F. Del Monte, K. Guerrero, Del Monte Coll.).

COLOMBIA: *Magdalena*: San Sebastián de Rábago, 2,000 m, Sierra Nevada de Santa Marta, 1–10 Apr. 1968, 4♀ (B. Malkin, AMNH). *Cuandiniamarca*: Tomine Dam, 2,600 m, 24 July 1988, 1♀ (C. Valderrama, CV). ECUADOR: *Pichincha*: Mt. Pichincha, Aug. 1944, 2♀ (C. W. Prescott, MCZ); Quito, 22 Apr. 1942, 2♀ (H. E. Frizzell, CAS); Timbaco, 14 Oct. 1989, 2♀ (L. Avilés, MECN). *Tungurahua*: Ambato, 9–11 June 1943, 45♀, 11♂ (H. E., D. L. Frizzell, CAS); Ambato region, 1 Sept. 1992, 1♀ (W. Piel, D. Fitzpatrick, Estevez, MECN); Baños, 1,800 m, Oct. 1937, 4♀ (W. Clarke, W. C. Macintyre, AMNH); 20

Apr. 1939, 1♂ (W. C. Macintyre, MCZ); 7 May 1942, 17♀, 3♂ (H. E. Frizzell, CAS); 15–21 June 1943, 50♀, 24♂ (H. E., D. L. Frizzell, CAS); Baños, Río Pastaza, 1,800 m, 4 Apr. 1958, 5♀ (W. Weyrauch, CAS); Pastaza Valley, between Baños and Nero, 1,000–1,700 m, Jan.–Mar. 1949, 1♀ (W. Clarke, W. C. Macintyre, AMNH); Puñapi, 19 June 1943, 30♀, 6♂ (H. E., D. L. Frizzell, CAS). *Bolívar*: Echeandía (Ontongo), 1989, 1♀ (G. Estévez, MECN). *Azuay*: Cuenca, 3 Apr. 1942, 21♀, 12♂ (H. E. Frizzell, CAS); S of Cuenca, 2,500–2,800 m, 15 Mar. 1965, 1♂ (L. Peña, MCZ); Lago Zumbucua, W Cuenca, 16 Feb. 1955, 2♀, 2♂ (E. I. Schlinger, E. S. Ross, CAS).

### *Cyclosa walckenaeri* (O. P.-Cambridge) Figures 333–343; Map 7A

*Turckheimia walckenaeritii* O. P.-Cambridge, 1889: 47, pl. 8, fig. 6, ♀. Three female syntypes from Volcán de Fuego, Guatemala, in BMNH, examined in 1968. The specimen has since been lost.

*Epicra walckenaeri* Keyserling, 1892: 98, pl. 5, fig. 85, ♀. Eleven female syntypes from Bogota, Colombia, in BMNH no. 1890.7.1.5004–5015, examined. The syntypes belong to three species and a lectotype is here designated. The paratypes included 4♀ *C. walckenaeri*, 5♀ *C. berlandi* and 1♀, 1 imm. *C. bifurcata*, 1 imm. (not determined).

*Cyclosa walckenaeri*:—F. P.-Cambridge, 1904: 495, pl. 47, fig. 9, ♀. Roewer, 1942: 761. Bonnet, 1956: 1326. Levi, 1977: 84, pl. 4, figs. 64–77, ♀, ♂, map 2. Species first placed in *Cyclosa* by McCook, 1894: 226, pl. 17, figs. 1, 2.

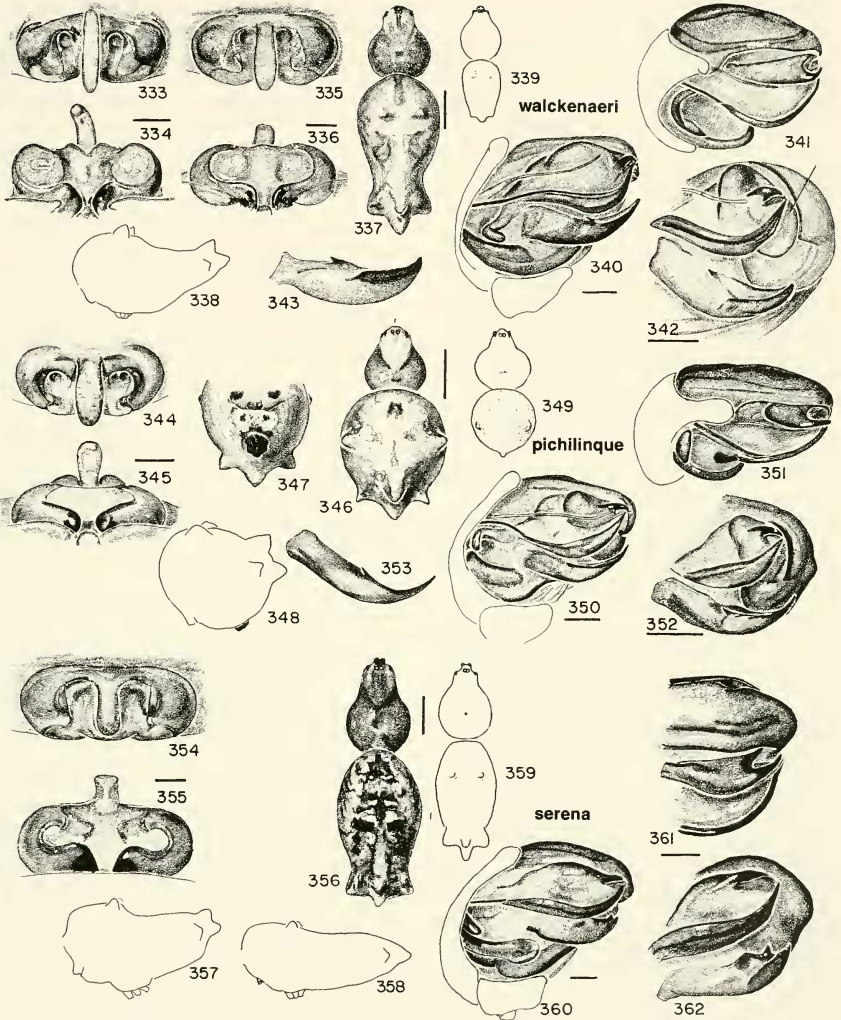
*Cyclosa trifida* F. P.-Cambridge, 1904: 495, pl. 47, fig. 7, ♀. Three female syntypes, slightly damaged, from Cobahon [Cahabón, Selander and Vaurie, 1962], Guatemala, in the BMNH 1905.4.28.2864–7, examined. First synonymized by Levi (1977).

*Cyclosa quadrituberosa* Franganillo, 1936: 84. Immature, male holotype in ACCII, examined. Franganillo's immature specimens appear to lack lateral posterior tubercles. First synonymized by Levi (1977).

*Cyclosa oculata*:—Bryant, 1940: 259, 337; Bryant 1942: 346; Bryant 1945: 367. Misidentification.

*Cyclosa quadrituberosa*:—Roewer, 1954: 1454. Bonnet, 1956: 1322 (unjustified name corrections).

*Note.* I made illustrations of *Turckheimia walckenaeritii* types in 1968 when visiting the BMNH. My note indicating that the three syntypes are variable, suggests



Figures 344–353. *C. pichilique* n. sp. 344–348, female. 344, 345, epigynum. 344, ventral. 345, posterior. 346, dorsal. 347, abdomen, ventral. 348, abdomen, lateral. 349–353, male. 349, dorsal. 350–353, palpus. 350, mesal. 351, apical. 352, 353, median apophysis.

Figures 354–362. *C. serena* n. sp. 354–358, female. 354, 355, epigynum. 354, ventral. 355, posterior. 356, dorsal. 357, 358, abdomen, lateral. 357, (Chile). 358, (Argentina). 359–362, male. 359, dorsal. 360–363, palpus. 360, mesal. 361, apical. 362, median apophysis.

Scale lines: 1.0 mm; genitalia 0.1 mm.



that a lectotype should be chosen, but the specimens have since been lost.

The types of *Epeira walckenaeri* Keyserling included 11 specimens; some may have been added at a later time. It included an original 2- by 4-cm label with perforation teeth, a 15- by 35-mm blue frame and a faded penciled note: "Sta. Fé de Bogota, Epeira (Cyclosa) walck . . . aeri Keys" with most of the specific name faded. The Keyserling illustrations are of *C. walckenaeri* (O. P.-Cambridge), recognized by the narrow scape with parallel sides. Paratypes of this species, examined from Taquara do Mundo Novo, Rio Grande do Sul, Brazil, BMNH 1890.7.1.5015-6, are *C. bifurcata* (Walckenaer).

The carapace of *Cyclosa quadrituberosa* specimen is 1.05 mm total length; the abdomen is missing.

Miss Bryant requested a specimen of *Cyclosa oculata* (Walckenaer), identified by Simon, from the Paris museum. However, the specimen she received came from the Dominican Republic, not the type locality (near Paris); furthermore, it was a specimen of *C. walckenaeria*, misidentified by Simon as *C. oculata* because of a similar abdomen. Miss Bryant (1940) published on this Dominican Republic specimen, and subsequently (before Levi, 1977) all American specimens having six tubercles on the abdomen were misidentified.

*Description.* Female from Chichen Itza. Carapace dark brown, cephalic region lighter (Fig. 337). Abdomen venter with various size black and white patches. Abdomen with anterior pair of tubercles, a posterior pair and two posterior tubercles in median line (Figs. 337, 338). Total length 5.8 mm. Carapace 2.1 mm long, 1.5 wide in thoracic region, 0.7 wide behind posterior lateral eyes. First femur 1.8 mm, patella and tibia 2.0, metatarsus 1.1, tarsus 0.5. Second patella and tibia 1.7 mm, third 1.0, fourth 1.6. Femora shorter than corresponding patellae and tibiae, except third, which is of same length.

Male from Campeche. Much darker

than female. Prosoma blackish brown. Abdomen black with a pair of dorsal white spots. Abdomen narrower than that of female (Fig. 339). Total length 2.8 mm. Carapace 1.75 mm long, 1.32 wide in thoracic region, 0.51 wide behind posterior median eyes. First femur 1.46 mm, patella and tibia 1.69, metatarsus 1.59, tarsus 0.60. Second patella and tibia 1.25 mm, third 0.70, fourth 1.30. First femora shorter than corresponding patellae and tibiae, others slightly longer.

*Note.* Males and females were collected together.

*Variation.* Total length of females 4.0 to 7.6 mm; males 2.7 to 4.8. Larger males may have a wider abdomen than the one illustrated and have a pair of anterior dorsal humps. Figures 333, 334, 337 illustrate a female from Yucatan; Figures 335, 336, 338 from Tortola, Virgin Islands; Figures 339-341 a male from Tortola; Figure 342 from Isla Magdalena, Baja California; Figure 343 from Bocas del Toro, Panama. These specimens were chosen because there were several females collected with a male, and the male's abdominal shape (Fig. 339) resembles that of the female, supporting their determination. The female from Tortola (Fig. 335), where *C. berlandi* is uncommon, had a wider scape, and the posterior median area were smaller than in females from Mexico. The ventral white spots on the abdomen may be on tubercles. All females from Baja California had the abdomen shorter than in specimens from other regions. The specimens from Sierra Nevada de Santa Marta, Colombia (MNHN), have the posterior median area of the epigynum relatively small.

*Diagnosis.* The female differs from *C. bifurcata* by having six (Figs. 337, 338) rather than five abdominal tubercles, and it differs from *C. berlandi* and *C. pichil-inque* by having the scape of the epigynum narrow, long, and with almost parallel sides (Figs. 333, 335). Only the three posterior abdominal tubercles separate the male *C. walckenaeri* (Fig. 339) from *C. turbinata*,



but some male *C. walckenaeri* may lack these tubercles. The keel on the median apophysis (Fig. 343) separates the male from *C. berlandi* (Fig. 332).

**Natural History.** *Cyclosa walckenaeri* has been found in diverse habitats: old coffee plantation; along fence at night; night collecting in Coamo; beach grapes in Puerto Rico; dwarf forest at El Yunque, Puerto Rico; citrus trees in the Lesser Antilles; savanna in Chiapas; thorn forest and on cactus in Baja California Sur; herbaceous vegetation and dry forest in north-eastern Colombia.

**Distribution.** Florida and southern Texas to Colombia, West Indies to Guianas (Map 7A).

**Specimens Examined.** UNITED STATES *Florida:* Collier Co.: Naples, ♀ (AMNH). *Dade Co.:* Miami Beach, ♀ (MCZ). *Texas:* Edinburgh, ♀♂ (AMNH); 16 km SE Edinburg, ♀♂ (AMNH); 24 km SW Harlingen, ♀ (AMNH); 8 km E Río Grande City (AMNH); Brownsville, ♀ (AMNH). *MEXICO Tamaulipas:* Las Calabazas, ♀ (USNM). *Baja California Sur:* Bahía de los Muertos, ♀♂ (CAS); 3 km E Cabo San Lucas, ♀ (CAS); Isla Magdalena, ♀♂ (CAS); ♀ (AMNH); 8 km S Miraflores Road to Las Casitas, ♀ (CAS); 8 km N La Paz, road to Pichilínque ♀ (CAS); La Paz, ♀ (CAS, MCZ); 63 km S La Paz on road to Todos Santos, ♀♂ (CAS); Punta Lobos, 1.6 km SE Todos Santos, ♀♂ (CAS); 4.8 km NW San Antonio, ♀ (CAS); 8 km W San José del Cabo, ♀♂ (DU); 11 km W San José del Cabo, ♀ (DU); 26 km NW Cabo San Lucas, ♀ (CAS); 25 km E San Lucas, ♀ (CAS); 19 km S Todos Santos, ♀ (CAS). *San Luis Potosí:* Tamazunchale, ♂ (AMNH). *Durango:* 16 km E El Salto, ♀ (AMNH). *Sinaloa:* 64 km S Culiacán, ♀ (AMNH); 8 km NW Río Culiacán, ♀ (AMNH). *Nayarit:* Tepic, ♀ (AMNH). *Veracruz:* Coscomatepec, ♀ (CAS); Jalapa, ♂ (CAS); 24 km W Jalapa, ♀ (AMNH). *México:* Toluca, ♀ (MCZ). *Michoacán:* 9.6 km N Cherán, ♂ (AD). *Puebla:* 6 km S Zacapoaxtla, 1♂ (AD). *Guerrero:* Tamarindos S. Papanoa, 17°17'N, 101°02'W, ♀ (MCZ). *Oaxaca:* Oaxaca, ♀ (MCZ); San Gerónimo, ♀ (AMNH); Soyaltepec, ♂ (AMNH). *Campeche:* Champoton, 19°21'N, 90°43'W, ♀ (MCZ); 6 km W Francisco Escarcega, ♂ (MCZ); outside Itacmbilxuman, S of Bolonchen de Rejon, Rt. 161, ♂ (MCZ). *Yucatán:* Chichen Itza, ♀♂ (AMNH); Balankanche Cave, 2 km E Chichen Itza, ♀ (MCZ); Dolores Otero, ♀ (AMNH); Uxmal, ♀ (CAS); 17.6 km E Valladolid on road to Ozal, 20°41'N, 88°10'W, 1♂ (CAS). *Quintana Roo:* Kobunlich ruins, 9 km S Francisco Villa, 18°26'N, 88°48'W, ♂ (MCZ). *Chiapas:* Cintalapa, ♀ (AMNH); El Real, ♀ (AMNH); Oaxaca, ♂ (AMNH); 24 km NW Arriaga,

♀ (AMNH); Lagunas de Montebello, ca. 48 km E Comitán, ♂ (CAS); 20 km NW Ocozocoautla, ♀ (CAS); La Zacuapala, ♂ (AMNH); Tapachula, ♂ (CAS). *GUATEMALA* Cobán, ♀ (AMNH). *EL SALVADOR* Instituto, ♀ (SMK). *NICARAGUA* Torreón, ♀ (JMM). *COSTA RICA* Chirral Paraiso [?], (MCZ); Gilarán [?], ♀ (MCZ). *San José:* Escazú, ♂ (USNM); San José, ♀ (AMNH). *Puntarenas:* Parrita, ♀ (MCZ). *PANAMA* Bocas del Toro: Río Changuinola, Corriente Grande, ♀♂ (MCZ). *Chiriquí:* Boquete, ♂ (MCZ); Cerro Punta, ♂ (AMNH). *Herrera:* 6 km Faldas Cerro Tigre, SE Paris, ♀ (MIUP); Sarigua, Dist. Parita, ♀♂ (MIUP). *Cocle:* Cerro Pená, nr. El Valle, ♀ (AMNH); Agnadulce, ♀ (AMNH). *Panamá:* La Chorrera, ♀ (AMNH); La Campana, 1♀ (AMNH); Univ. Panama campus, ♀ (AMNH).

*BAHAMA ISLANDS* Berry Isl.: Fraziers Hog Cay, ♂ (AMNH). *Cat Island:* Arrhurs Town, ♀♂ (MCZ). *Great Abaco Isl.:* Marsh Harbor, ♂ (AMNH). *Long Island:* ♀ (MCZ). *CUBA* Camagüey: Camagüey, ♀ (AMNH); savannas, Agramonte Camagüey, ♀♂ (AMNH); Soledad, ♀♂ (MCZ). *Holguín:* Banes, ♀♂ (AMNH, MCZ). *Isla de Piños:* Sierra las Casas, ♀ (AMNH). *Matanzas:* Pan de Palenque, ♀ (AMNH). *Pinar del Río:* San Vicente, ♀♂ (AMNH). *Santa Clara:* Vega Alta, ♀ (AMNH). *JAMAICA* many records (AMNH, MCZ). *HAITI* Kenscoff, 1,400 m, ♀♂ (AMNH, MCZ); Port au Prince, ♀♂ (AMNH, MCZ); île de la Gonave, ♀ (AMNH). *DOMINICAN REPUBLIC* *La Altagracia:* Gran Chorra, ♀ (Del Monte Coll); Playa Bayahiba, ♀ (MCZ). *Puerto Plata:* Puerto Plata, ♀ (MCZ). *Samana:* Sánchez, ♀ (AMNH). *Valdez:* W Bení, ♀ (AMNH). *Barahona:* Valle de Polo, ♂ (AMNH); Sierra Martín García, ♀ (AMNH). *La Vega:* Cordill. Central La Vega, ♀ (AMNH). *PUERTO RICO* very common, many records (AMNH, CAS, MCZ). *VIRGIN ISLANDS* *St. Croix:* Christiansted, ♀♂ (MCZ). *St. Thomas:* ♀ (AMNH, MCZ); Flagstick Hill, ♀ (AMNH). *St. John's:* ♀ (AMNH); Annaberg, ♀ (MCZ). *BRITISH VIRGIN ISLANDS* Little Saba, ♀ (AMNH); Peter Isl., ♀ (AMNH); Bath's and Devil's Bay, Virgin Gorda, ♀ (AMNH, MCZ); Salt Island, ♀ (AMNH); Tortola, ♀ (AMNH); Tortola, nr. Steele Point, ♀♂ (AMNH, MCZ). *LESSER ANTILLES* *Gadeloupe:* Marie Galante, ♀ (FSCA). *TRINIDAD* Bayshore, ♀ (AMNH).

*VENEZUELA* Sucre: Carúpano, ♀ (MNHN 18871). *SURINAM* Matappica Beach, ♀ (AMNH). *COLOMBIA* *Magdalena:* S Cabaña "Villa Culebra" nr. Bonda, ca. 10 km E Santa Marta, ♂ (SMK); Sierra Nevada de Santa Marta, ♀ (AMNH 8405); Gaira, ♀ (MCZ).

### *Cyclosa pichilínque* new species Figures 344–353; Map 7A

**Holotype.** Female holotype, male allotype and 14 female and three immature paratypes from Puerto de Pichilínque, Baja California Sur, Mexico, 22 Apr. 1944 (M. Correa), in AMNH, a female kept in

MCZ. The specific name is a noun in apposition after the locality.

*Description.* Female holotype. Carapace dark brown, cephalic region yellowish (Fig. 346). Abdomen venter with black booklung covers and black spinnerets, and with a median white square that often includes a pair of black spots (Fig. 347). Abdomen with six tubercles (Fig. 346). Total length 4.0 mm. Carapace 1.6 mm long, 1.2 wide in thoracic region, 0.6 wide behind posterior lateral eyes. First femur 1.4 mm, patella and tibia 1.6, metatarsus 0.9, tarsus 0.5. Second patella and tibia 1.3 mm, third 0.7, fourth 1.2. First femora shorter than corresponding patellae and tibiae, third and fourth slightly longer.

Male allotype. Coloration much darker than that of female, carapace brown. Abdomen with only three pairs of tubercles (Fig. 349). Total length 2.6 mm. Carapace 1.27 mm long, 1.14 wide in thoracic region, 0.48 wide behind posterior lateral eyes. First femur 1.27 mm, patella and tibia 1.27, metatarsus 0.63, tarsus 0.41. Second patella and tibia 1.04 mm, third 0.55, fourth 0.95.

*Note.* Males and females were collected together.

*Variation.* Specimens of *C. walckenaeri* from Baja California all have a slightly shorter abdomen than those from mainland Mexico and resemble *C. pichilinqué*.

*Diagnosis.* *Cyclosa pichilinqué* is distinguished from specimens of *C. walckenaeri* by having a short abdomen, barely longer than wide (Figs. 346–348), and by having the scape of the epigynum wider (Fig. 344) and the posterior median plate smaller (Fig. 345) than in *C. walckenaeri*. *Cyclosa pichilinqué* is very distinct compared with mainland Mexican and West Indian specimens of *C. walckenaeri* but is less distinct from Baja California specimens.

*Distribution.* Baja California Sur (Map 7A); no other specimens were found.

#### *Cyclosa serena* new species

Figures 354–362; Map 6E

*Cyclosa oculata*:—Archer, 1963: 23. Erroneous determination.

*Holotype.* Female holotype, male allotype, one male and five female paratypes from Loma de Peñuelas, 6 km S de La Serena, Coquimbo Prov., Chile (A. F. Archer), in AMNH. The specific name is a noun in apposition after the locality.

*Description.* Female holotype. Carapace dark brown, lightest on each side of cephalic region (Fig. 356). Abdomen venter with a pair of white patches. Abdomen with six tubercles (Figs. 356, 357). Total length 6.5 mm. Carapace 2.4 mm long, 1.5 wide in thoracic region, 0.8 wide behind posterior lateral eyes. First femur 2.0 mm, patella and tibia 2.5, metatarsus 1.2, tarsus 0.6. Second patella and tibia 2.0 mm, third 1.2, fourth 2.1. All femora shorter than corresponding patellae and tibiae.

Male allotype. Coloration as in female. Abdomen as in female, including all the tubercles (Fig. 359). Total length 4.6 mm. Carapace 2.0 mm long, 1.4 wide in thoracic region, 0.5 wide behind posterior lateral eyes. First femur 1.8 mm, patella and tibia 1.8, metatarsus 1.1, tarsus 0.6. Second patella and tibia 1.5 mm, third 0.4, fourth 1.5. Femur of first leg same length, others slightly longer than corresponding patellae and tibiae.

Males and females were collected together; *C. serena* appears to be the only species of *Cyclosa* in Chile.

*Variation.* Total length of females 5.1 to 8.3 mm, males 4.2 to 4.6. Argentinian specimens have only five tubercles, lacking the anterior median tubercle (Fig. 358). The illustrations were made from the female holotype and allotype, except Figure 358, which is from a specimen from Argentina.

*Diagnosis.* *Cyclosa serena* is distinguished from others by the short, parallel-sided scape of the epigynum (Fig. 354); the male has a unique anterior facing tooth on the margin of the median apophysis (Figs. 360, 362).

*Natural History.* One specimen came from a horizontal web between floating plants, in Santa Fé Province, Argentina.

*Distribution.* Argentina, Chile (Map. 6E).

*Specimens Examined.* ARGENTINA *Entre Ríos*: Nov. 1974, 1♂ (Cesari, MAGN); *Córdoba*: Calamuchita, Mar. 1954, 1♀ (M. J. Viana, MAGN); Mar. 1956, 1♂ (M. J. Viana, MAGN). *Santa Fé*: Arroyo El Toba, 14 Oct. 1976, 1♀ (M. E. Galiano, MAGN). CHILE *Atacama*: 3 km S Vallenar, 460 m, under stone, scrubby mountain side, 7 Jan. 1985, 1♀ (N. I. Platnick, O. F. Francke, AMNH). *Coquimbo*: Cerro de Talinay, Talinay, 29 Nov. 1961, 3♀ (A. F. Archer, AMNH); 32 km E La Serena, 3 Dec. 1950, 1♂ (E. S. Ross, A. E. Michelbacher, CAS). *Nuble*: Chillán, 3♀ (L. Peña, IRSNB).

*Cyclosa haiti* new species  
Figures 363–367; Map 3A

*Holotype.* Female holotype from La Visite, 6,000–7,000 ft [2,000–2,300 m], Haiti, 16–23 Sept. 1934 (P. J. Darlington), in MCZ. The specific name is a noun in apposition after the locality.

*Description.* Female holotype. Thoracic region of carapace dark brown grading into yellowish cephalic region (Fig. 365). Sternum mostly white with brown lines limiting white areas. Abdomen venter white with symmetrical dark lines (Fig. 366). Abdomen with a pair of anterior dorsal tubercles, a pair of posterior lateral tubercles and a single median, posterior tubercle (Figs. 465, 367). Total length 4.8 mm. Carapace 1.5 mm long, 1.0 wide in thoracic region, 0.7 wide behind posterior lateral eyes. First femur 1.4 mm, patella and tibia 1.6, metatarsus 0.8, tarsus 0.5. Second patella and tibia 1.4 mm, third 0.8, fourth 1.3. First and second femora shorter than corresponding patellae and tibiae, third and fourth of same length.

*Variation.* Total length of females 4.8 to 6.0 mm.

*Diagnosis.* *Cyclosa haiti* is distinguished from *C. walckenaeri* by having only five abdominal tubercles (Fig. 367) and from *C. bifurcata* by the narrower median plate in ventral and posterior views of the epigynum (Figs. 363, 364).

*Distribution.* Greater Antilles, Hispaniola, Jamaica and Haiti (Map SA).

*Specimens Examined.* GREATER ANTILLES *Jamaica*: Portland Par., Hardvar Gap, 20 Nov. 1957, 1♀ (A. M. Chickering, MCZ). *Haiti*: Furcy, Mt. Cabao, 2,100 m, 26 Mar. 1940, 1♀ (Folk, MCZ); Furcy,

1,600 m, 9 Jan. 1998, 2♀ (C. K. Starr, MCZ). *Mona Island*: Aug. 1944, 1♀ (H. Beatty, MCZ).

*Cyclosa bifurcata* (Walckenaer)  
Figures 368–377; Map 8A

*Epeira bifurcata* Walckenaer, 1841: 145. Keyserling, 1864: 142, pl. 6, figs. 22, 23. ♀. Specimens from Guyana, lost. Keyserling, 1892: 97, pl. 5, fig. 72.

*Epeira fusiformis* Taczanowski, 1878: 173, pl. 2, fig. 22, ♀. Female lectotype here designated from hymenopteran nest, Amable María, Junín, Peru, in PAN, examined. The male paralectotype is an unknown *Wagneriana* species. NEW SYNONYMY.

*Epeira walckenaerit* Keyserling, 1892: 98, pl. 5, fig. 73. ♀, ♂. Paratypes from Bogota, Colombia, Tacquara do Mundo Novo and Rio Grande do Sul, Brazil, in BMNH, examined. (Lost holotype and illustrations are *C. walckenaeri* Keyserling [=*walckenaeri*] (O. P.-Cambridge).)

*Turckheimia scelsesta* O. P.-Cambridge, 1894: 268, pl. 39, fig. 10, ♀. Female holotype from San José, Costa Rica, in BMNH, examined. Erroneously synonymized with *C. diversa* by F. P.-Cambridge, 1904. NEW SYNONYMY.

*Cyrtophora fusiformis*:—Banks, 1898: 256.

*Cyclosa fusiformis*:—F. P.-Cambridge, 1904: 497. Roever, 1942: 760. Bonnet, 1956: 1316.

*Cyclosa globulifaciens* Hingston, 1932: 90, 369. Female from Essequibo River, Guyana, in BMNH, lost. Roever, 1942: 760. Bonnet, 1956: 1316. NEW SYNONYMY.

*Cyclosa bifurcata*:—Roever, 1942: 759. Bonnet, 1956: 1309.

*Note.* I am following Keyserling's (1864) interpretation of *Epeira bifurcata* Walckenaer. Keyserling had specimens from Bogota that survived in the BMNH (1890.7.1.4639) and could be examined. In 1892 Keyserling redescribed *E. bifurcata*, and decided that some specimens of his are a second, similar species, because they have two median posterior tubercles on the abdomen, whereas *E. bifurcata* has only one. He named the new species *Epeira walckenaeri*, but some paratypes examined from Taquara do Mundo Novo [Rio Grande do Sul], Brazil, in the BMNH (1890.7.1.505/6), are also *bifurcata*, having a tiny, extra tubercle on the median posterior end of the abdomen. Keyserling's illustration is clearly *C. walckenaeri* (O. P.-Cambridge), recognized by the parallel margins of the scape of the epigynum. Keyserling's name *walckenaeri* is actually a

synonym, as well as a homonym, of *C. walckenaeri* (O. P.-Cambridge). Keyserling died in 1889 of tuberculosis of the brain (Bonnet, 1945) and his volume (1892) was published subsequently by G. Marx. Hingston (1932: 112, 113) mentions *C. bifurcata* and described *Cyclosa globulifaciens* with total length of 9 mm and with the characteristic abdominal tubercles of *C. bifurcata* (Walckenaer).

*Cyclosa fusiformis* was first placed in *Cyclosa* by F. P.-Cambridge.

The holotype of *Turckheimia sclesta*, marked *Cyclosa diversa*, arrived from the BMNH, but the label indicated that it was the type of *sclesta*.

*Description.* Female from Barro Colorado Island, Panama. Carapace dark brown grading into yellowish eye region (Fig. 370). Abdomen venter black with median black maculations and a pair of white patches (Fig. 371). Abdomen with only five tubercles (Figs. 370–372). Total length 8.0 mm. Carapace 2.8 mm long, 1.8 wide in thoracic region, 1.1 wide behind posterior lateral eyes. First femur 2.1 mm, patella and tibia 2.6, metatarsus 1.3, tarsus 0.7. Second patella and tibia 2.2 mm, third 1.3, fourth 2.3. All femora shorter than corresponding patellae and tibiae.

Male from Engo. Marcilac, São Paulo State, Brazil. Coloration much darker than in female; carapace brown (Fig. 373). Abdomen black, with a pair of anterior dorsal white patches (Fig. 373); venter with a pair of white spots. Sides with an irregularly shaped white longitudinal band. Abdomen with three posterior tubercles (Fig. 373). Total length 3.6 mm. Carapace 1.78 mm long, 1.35 wide in thoracic region, 0.49 wide behind posterior lateral eyes. First femur 1.49 mm, patella and tibia 1.45, metatarsus 0.86, tarsus 0.49. Second patella and tibia 1.18 mm, third 0.74, fourth

1.40. All femora about the same length as corresponding patella and tibia.

*Note.* Males and females are collected together infrequently.

*Variation.* Total length of females 5.3 to 9.7 mm, males 3.4 to 4.8. Some females show a minute tubercle in place of the missing dorsal one. The illustrations were made from a female from Barro Colorado Island, Panama, and a male from Engo. Marsilac, São Paulo, Brazil, collected with females. Most males are large and show the abdominal tubercles.

*Diagnosis.* *Cyclosa bifurcata* is distinguished from others by having only five abdominal tubercles (Figs. 370–372) and by having a very large median plate in the epigynum and the depressions close to the sides of the base (Fig. 368). The male palpus is very distinct, having the conductor projecting beyond the bulb and a long, curved conductor tooth (Figs. 374–376).

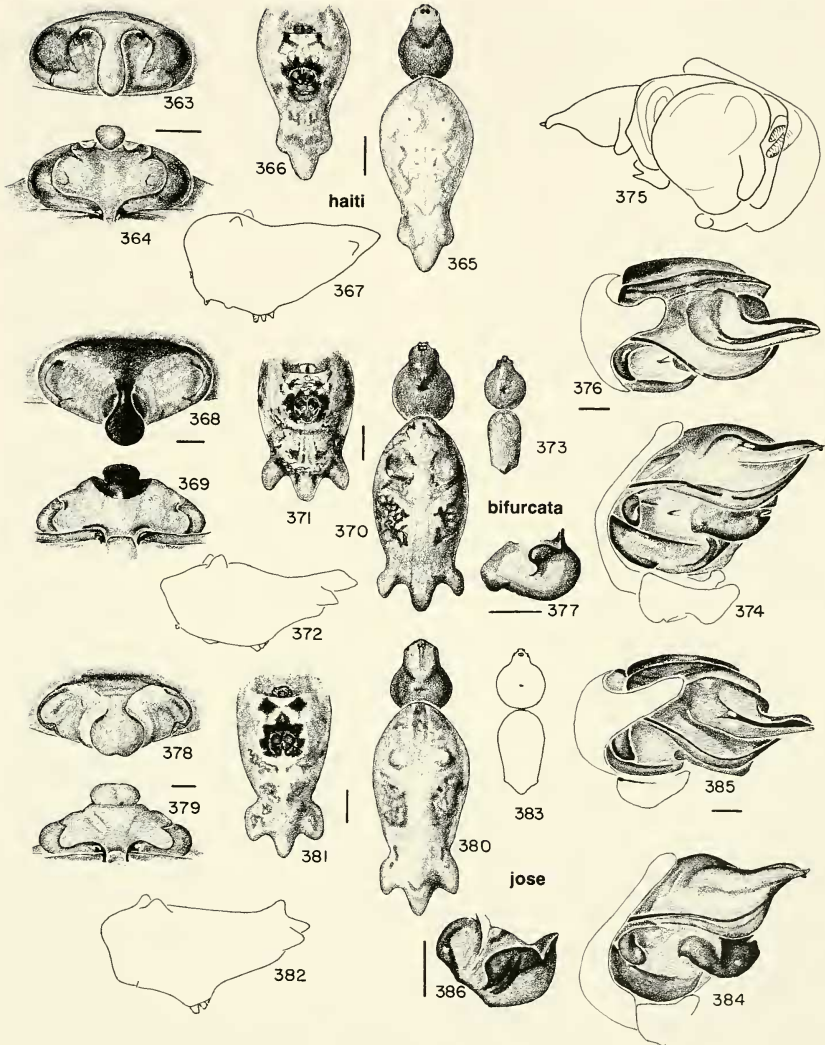
*Natural History.* Females were collected on sunny roadside in Trinidad, and on leaves of agave in Depto. Antioquia, Colombia; a male was collected by canopy fogging at the Tambopata Reserve in Peru and also as prey of sphecid wasps 80 km N of Manaus, Brazil.

*Distribution.* Widespread, from Hispaniola, Costa Rica, south to northern Argentina and southern Brazil (Map 8A).

*Specimens Examined.* COSTA RICA *San José:* San Antonio de Escazú, Feb. 1988, 2♂ (W. Eberhard, USNM). PANAMA *Cocle:* El Valle, Jan. 1947, 1♀ (N. L. H. Krauss, AMNH). PANAMA *Trinidad:* Barro Colorado Island, Aug. 1939, 1♀ (A. M. Chickering, MCZ); Sept. 3♀ (P. Rau, MCZ); Summit, Nov. 1946, 1♀ (N. L. H. Krauss, AMNH).

GREATER ANTILLES *Hispaniola:* Dominican Republic, Puerto Plata, July, Aug. 1941, 8♀ (D. Hurst, MCZ). LESSER ANTILLES *Trinidad:* El Tueche, 16 Dec. 1934, 3♀ (N. A. Weber, MCZ); Simla, 25 Apr. 1964, 2♀ (A. M. Chickering, MCZ); La Laja Road, Arima Parish, 7 Feb. 1984, 1♀ (J. Codrington, USNM).





Figures 368–377. *C. bifurcata* (Walckenaer). 368–372, female. 368, 369, epigynum. 368, ventral. 369, posterior. 370, dorsal. 371, abdomen, ventral. 372, abdomen, lateral. 373–377, male. 373, dorsal. 374–377, left palpus. 374, mesal. 375, dorsal. 376, apical. 377, median apophysis.

Figures 378–386. *C. jose* n. sp. 378–382, female. 378, 379, epigynum. 378, ventral. 379, posterior. 380, dorsal. 381, abdomen, ventral. 382, abdomen, lateral. 383–386, male. 383, dorsal. 384–386, palpus. 384, mesal. 385, apical. 386, median apophysis.

Scale lines: 1.0 mm; genitalia 0.1 mm.



GUYANA Kartabo, 1924, 1 ♀ (AMNH). SURINAM *Brokopondo*: Browns Berg, 5°N, 55°27'W, 20 Feb. 1982, 1 ♀ (D. Smith Trail, MCZ). FRENCH GUIANA Isles de Salut, 1 ♂ (K. Jelski, PAN). VENEZUELA *Aragua*: Rancho Grande, 1 ♀ (C. T. Collins, AMNH). COLOMBIA *Magdalena*: Sierra Nevada de Santa Marta, 1 ♀ (MNHN 8405a). *Santander*: Río Suárez, 800–1,000 m, 11–17 Aug. 1946, 1 ♀ (AMNH). *Antioquia*: El Peñol, 2,100 m, 9 Mar. 1974, 1 ♀ (A. B. Schneble, MCZ); San Vicente, 29, 30. Dec. 1986, 3 ♀ (M. A. Serna, MCZ). *Cundinamarca*: along dirt road 3 mi SE Finca Bella Vista, W Sosaíma, 13 May 1965, 1 ♀ (P. R., D. L. Craig, CAS). *Boyacá*: Río Upía, 800–950 m, Nov., Dec. 1945, 1 ♀ (AMNH). *Huila*: Finca Meremberg, 10 km E Sta. Leticia, Mar. 1979, 3 ♀, 2 ♂ (W. Eberhard 1867, MCZ); 12 km W Sta. Leticia, 2,300 m, Mar. 1976, 1 ♂ (W. Eberhard, 1077, MCZ); 12 km E Sta. Leticia, 2,300 m, Mar. 1976, 3 ♀, 1 ♂ (W. Eberhard 1078, MCZ). *Putumayo*: El Pepino, 1,000 m, on road to Mocoa, 21 May 1973, 1 ♀ (N. Leist, SMNK). ECUADOR *Napo*: Coca, 9–19 Feb. 1986, 1 ♀ (McKamey, DU); 20 km E Puerto Napo, Alinahui, 01°00'S, 77°25'W, Oct. 1945, 4 ♀ (V., B. Roth, CAS). *Morena-Santiago*: Chiguaza, Wakami Prov., 22 May 1977, 2 ♀ (N. Engler, MCZ). PERU *Loreto*: Pebas (& São Paulo de Olivença), 1 ♂ (M. de Mathan, MNHN 4095a). *Cuzco*: Quincemil [Rio Marcapata], 750 m, 13 Apr. 1947, 1 ♀ (J. C. Pallister, AMNH). *Madre de Dios*: Zona Reservada Tambopata, 14 June 1985, 1 ♀ (J. Coddington, MUSM); 6–14 Sept. 1984, 1 ♂ (T. L. Ervin, USNM). *Ayacucho*: Moxobamba, 2 ♀ (M. de Mathan, MNHN 1057-4). BRAZIL *Pará*: Camindé, Rio Gurupi, Mar–May 1964, 1 ♀, 1 imm. (J. Carvalho, AMNH). *Amazonas*: Km 41 Reserve, 60 km N Manaus, 18 Apr. 1991, 1 ♀ (H. Fowler, E. Venticinque, R. S. Vieira, MCZ); 80 km N Manaus, areas of Smithsonian, 1988–90, 1 ♂ (E. Morato, SMNK); Manaus, Reserva Ducke, 1 July 1987, 1 imm. (H. Höfer, SMNK); Manaus, Igapó Tarumã Mirim, 25 Sept. 1987, 1 ♀ (H. Höfer, SMNK). *Alagoas*: Mangubiras, Camargo, Andrade, Oct. 1952, 1 ♀ (A. Dente, MZSP 13154). *Bahia*: Fazenda Almada, Urucua, 27 Nov. 1977, 2 ♂ (J. S. Santos, MCN 10343, 10491a); Iguaçu, 1 Aug. 1924, 1 ♀ (A. Roman, NHRM). *Mato Grosso*: Barro do Tapirapé, 5–10 Feb. 1964, 1 ♀ (B. Malkin, MZSP 3347). *São Paulo*: Campos da Serra, ca. Ribeira do R Magi Grassú, 3 Apr. 1943, 1 ♂ (F. Lane, MZSP 13 158); Estr. Santo Amaro, Eng Marciac, 29 June 1966, 10 ♀, 1 ♂ (P. Biasi, MZSP 1948); Eng. Marciac, 30 June 1967, 1 ♀ (P. Biasi, MZSP 6943); Ipiranga, 9 Mar. 1948, 1 ♂ (P. Caneschi, MZSP 10779). *Paraná*: Corupa, Feb. 1949, 1 ♀ (A. Müller, AMNH); Foz de Iguaçu, 18 Oct. 1995, 1 ♀ (H. Höfer, SMNK); Rio Azul, 3 Apr. 1993, 1 ♀ (R. Böcon, MCN 23606). *Rio Grande do Sul*: Caçapava do Sul, 24 July 1977, 1 ♀ (D. Link, MCN 6326); Campo Bom, 19 Oct. 1957, 1 ♀ (C. J. Becker, MCP 0127); Capaneinho, Cachoeira do Sul, 12 May 1993, 1 ♀ (R. G. Buss, MCP 3612); Gravataf, 2 Feb. 1992, 1 ♂ (A. D. Brescovit MCN 22101); Montenegro, 3 Nov. 1977, 1 ♂ (A. A. Lise, 7150); Santa Maria, 8 Oct.

1985, 2 ♀ (I. M. Dall' Astra, MCN 15286); São Leopoldo, 1 May 1964, 1 ♀ (C. Valle, MZSP 6955); Tenente Portela, 29 Nov. 1978, 1 ♂, 1 imm. (H. Biscoff, MCN 3489, 8427a); Viamão, 23 June 1991, 1 ♀ (L. Moura, MCN 21202). PARAGUAY *Alto Paraná*: Tatitupí Reserve, 14 June 1984, 1 ♀ (L. Baert, J. P. Maelfait, IRSNB). ARGENTINA *Misiones*: Cataratas de Iguazú, 26 Mar. 1968, 1 ♀ (M. E. Galiano, MACN); Mar. 1976, 1 ♀, 1 ♂ (R. M. Capocasaie, CAS); Eldorado, 26°28'S, 54°43'W, Sept.–Nov. 1964, 1 ♀ (A. Kovacs, AMNH); Montecarlo, 5 Dec. 1965, 1 ♀ (Giacchi, AMNH); Pto. 17 de Octubre, Oct. 1954 [Puerto Libertad], 1 ♀, 2 ♂ (R. D. Schiapelli, de Carlo, MACN); Pto. Bemberg [Puerto Libertad], Oct.–Dec. 1952, 1 ♀ (M. J. Viana, MACN 3586); 1 May 1953, 1 ♀ (A. Gaiú, W. Partridge, MACN 3136); Sept. 1963, 5 ♀ (R. D. Schiapelli, de Carlo, MACN); Río Uruguaf, Sept. 1948, 1 ♀, 1 ♂ (A. Gaiú, MACN 5516); Santa María, Dec. 1948, 1 ♀ (M. J. Viana, MACN); Nov., Dec. 1952, 1 ♀, 1 ♂ (M. J. Viana, MACN 3585).

### *Cyclosa jose* new species

Figures 378–386; Map 8B

*Holotype*. Female holotype and male paratype from nr. San José, San José Prov., Costa Rica, 1,100 m, Aug. 1979 (W. Eberhard, 1882–91), in MCZ. The specific name is a noun in apposition after the locality.

*Description*. Female holotype. Carapace beige, sides of thorax dark brown (Fig. 380). Abdomen venter with three black patches (Fig. 381). Abdomen with a dorsal pair of humps and four posterior tubercles (Figs. 380–382). Total length 8.5 mm. Carapace 2.5 mm long, 1.9 wide in thoracic region, 1.0 wide behind posterior lateral eyes. First femur 1.9 mm, patella and tibia 2.4, metatarsus 1.2, tarsus 0.6. Second patella and tibia 2.0 mm, third 1.2, fourth 2.1. All femora shorter than corresponding patellae and tibiae.

Male paratype. Coloration darker than in female, carapace brown. Abdomen with small pair of anterior and three posterior tubercles (Fig. 383). Total length 4.6 mm. Carapace 2.0 mm long, 1.5 wide in thoracic region, 0.6 wide behind posterior lateral eyes. First femur 1.7 mm, patella and tibia 1.6, metatarsus 0.9, tarsus 0.5. Second patella and tibia 1.3 mm, third 0.8, fourth 1.4. All femora about same length as corresponding patellae and tibiae.

*Note*. Males and females were collected together.

**Diagnosis.** *Cyclosa jose* is distinguished from *C. bifurcata* by having six tubercles on the abdomen (Figs. 380–382) and by having a short, nearly circular scape (Fig. 378). The lobe of the median apophysis of the male palpus is wider (Fig. 386) than that of *C. bifurcata* (Fig. 377).

**Distribution.** Costa Rica (Map 8B).

**Specimens Examined.** COSTA RICA *San José*: San José, zoological park, 7 Jan. 1979, 1♂ (J. Coddington, MCZ).

### *Cyclosa vicente* new species

Figures 387–390; Map 6E

**Holotype.** Female holotype from São Vicente do Sul, Rio Grande do Sul, Brazil, 2 Dec. 1981 (C. J. Becker), in MCN no. 9936. The specific name is a noun in apposition after the locality.

**Description.** Female holotype. Carapace yellow with white setae, sides of thoracic region brown (Fig. 389). Abdomen white with some gray streaks dorsally (Fig. 389); venter white. Abdomen with two pairs of dorsal tubercles, two median posterior, and one pair between epigynum and spinnerets (Figs. 389, 390). Total length 6.0 mm. Carapace 2.1 mm long, 1.5 wide in thoracic region, 0.9 wide behind posterior lateral eyes. First femur 1.6 mm, patella and tibia 1.9, metatarsus 1.0, tarsus 0.5. Second patella and tibia 1.7 mm, third 1.1, fourth 1.8. All femora shorter than corresponding patellae and tibiae.

**Note.** *Cyclosa espinoso* may be the male of *C. vicente*.

**Variation.** Total length of females 5.7 to 6.7 mm.

**Diagnosis.** Unlike *C. diversa*, *C. vicente* has the seminal receptacles placed more anteriorly (Fig. 387), and there is a pair of deep notches on the posterior median plate (at 2h and 10h in Fig. 388).

**Specimens Examined.** BRAZIL *Mato Grosso*: Chavantina, Oct. 1946, 1♀ (H. Sick, MZSP 1319). *São Paulo*: Piracununga, 13 June 1950, 1♀ (Schubart, MZSP 7117). *Paraná*: Cavinna [?], 1947, 1♀ (A. Maller, AMNH); Rolândia, 1948, 1♀ (A. Maller, AMNH). *Santa Catarina*: Corupá, Feb. 1949, 1♀ (A. Maller, AMNH). *Rio Grande do Sul*: 1♀ (P. Rambo, MNRJ); Guaíba, 29 Oct. 1994, 1♀ (A. A. Lise, MCP 5655); Vião, 19 Apr. 1996, 1♀ (A. A. Lise, MCN 0632a).

ARGENTINA *Misiones*: Puerto Bemberg [Puerto Libertad], Pasarela del Río Uruguay-I, Jan. Feb. 1950, 1♀ (A. Gaii, W. Partridge, MACN 3137).

### *Cyclosa diversa* (O. P.-Cambridge)

Figures 391–412; Map 8B

*Turekheimia diversa* O. P.-Cambridge, 1894: 136, pl. 16, fig. 11, ♀. Female lectotype here designated, and three female and one immature paralectotypes from Teapa, Tabasco, Mexico, in BMNH, no. 1905.4.25.2888–93, examined.

*Cyclosa diversa*:—F. P.-Cambridge, 1904: 496, pl. 47, fig. 10, ♀. Roewer, 1942: 759. Bonnet, 1956: 1316. Alayón, 1993: 4, fig. 3, ♀.

*Cyclosa diversa*:—F. P.-Cambridge, 1904: 335, fig. 110, ♂. Male holotype from Soledad garden, Cienfuegos Prov., Cuba, in MCZ, examined. Brignoli, 1983: 266. Alayón, 1993: 2. NEW SYNONYMY.

*Cyclosa nodosa*:—Alayón, 1982: 4 [not *nodosa* (O.P.-Cambridge)].

**Note.** The *Turekheimia diversa* type material, including five specimens, was labeled *Cyclosa diversa* (O. P. Cambr.). One with a broken embolus on the left side in the epigynum was designated lectotype; of the other four, one had a broken embolus on its right side, one female lacked the embolus, the third had an unsclerotized epigynum (apparently it had just molted), and the fourth was immature.

The female, erroneously described by Alayón for *Cyclosa brevis*, is an unnamed species of *Wagneriana*.

**Description.** Female from Chiapas. Thoracic region of carapace brown, grading into yellowish cephalic region (Fig. 401). Abdomen venter black with a pair of white patches (Fig. 405). Abdomen with an anterior pair of tubercles, a posterior pair and two median posterior tubercles (Figs. 401–404). Total length 6.5 mm. Carapace 2.4 mm long, 1.8 wide in thoracic region, 1.1 wide behind posterior lateral eyes. First femur 1.7 mm, patella and tibia 2.2, metatarsus 1.0, tarsus 0.6. Second patella and tibia 1.6 mm, third 1.1, fourth 2.0. Femora shorter than corresponding patellae and tibiae except third, which is of same length.

Male holotype of *C. brevis*. Carapace dark brown grading into yellowish cephalic region (Fig. 406). Sternum brown. Abdo-

men white with black marks (Fig. 406); venter black with a pair of white spots. Abdomen with four indistinct tubercles, only posterior median one distinct (Fig. 406). Total length 2.4 mm. Carapace 1.26 mm long, 1.00 wide in thoracic region, 0.44 wide behind posterior lateral eyes. First femur 0.79 mm, patella and tibia 0.98, metatarsus 0.49, tarsus 0.35. Second patella and tibia 0.78 mm, third 0.48, fourth 0.74. Femora shorter than corresponding patellae and tibiae except third, which is slightly longer.

*Notc.* Males and females were not collected together. They are matched because of the long tooth of the male palpal conductor, which breaks off and remains stuck in the female epigynum (Figs. 393, 395, 399).

*Variation.* Total length of females 4.3 to 11.5 mm, males 2.0 to 4.3. This species is variable. The abdomen may have the posterior median tubercles swollen (Figs. 402, 403), the length of the epigynal scape varies (Figs. 391, 397), the shape of the median plates is variable (Figs. 391–400). At first, I considered *C. diversa* to be numerous similar species but later could not separate them anymore. Figures 391 and 392 illustrate specimens from Oaxaca, Mexico; Figures 393, 394, 402 from Honduras; Figures 395, 396 from Costa Rica; Figures 397, 398 from Depto. Valle, Colombia; Figures 399, 400, 404 from Manaus, Brazil; Figure 401 from Chiapas, Mexico; and Figures 403, 405 from Rio Grande do Sul. Figures 406, 411, 412 illustrate males from Manaus, Brazil; Figures 407, 408 from Veracruz, Mexico; and Figures 409, 410 from Cuba.

*Diagnosis.* The female *C. diversa* may be distinguished from other *Cyclosa* spe-

cies by the swollen posterior lateral tubercles frequently found on the abdomen (Figs. 402, 403), but not always present. Also, it can be distinguished by the club-shaped scape with depressions next to the base of the scape (Figs. 391, 393, 395, 397, 399), by the broken conductor teeth remaining in the epigynum and by the openings of the epigynum, best seen in posterior view, which are always separated from the lateral margin by about one-quarter of the width of the base (Figs. 392, 394, 396, 398, 400). The male can be separated from other species by the long conductor tooth (Figs. 407–410), which is frequently broken off (Figs. 411, 412). Unlike *C. bifurcata*, (Figs. 374–376), in *C. diversa* the conductor does not project beyond the bulb (Figs. 407, 408).

*Natural History.* A female was collected in cloud forest in Colombia, and by fogging canopy in Tambopata Reservation, Peru. *Cyclosa diversa* uses golden instead of white silk (W. Eberhard, personal communication).

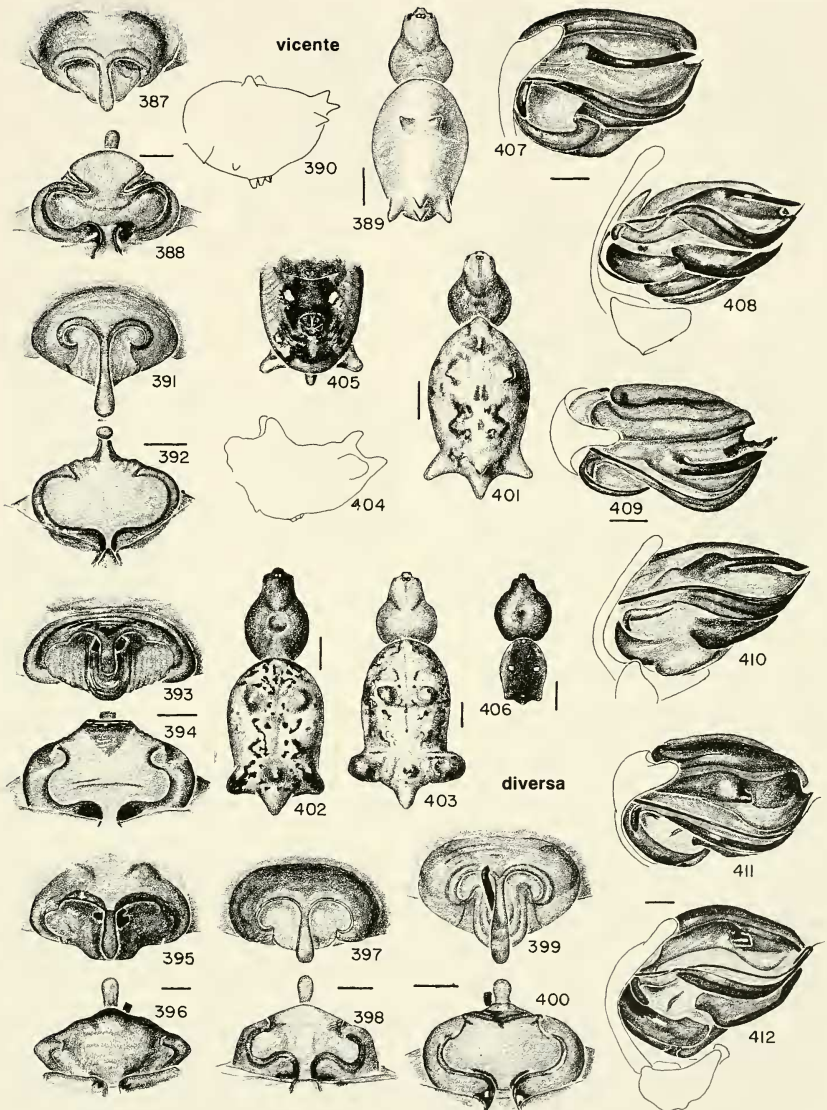
*Distribution.* Widespread, Mexico to Argentina and Greater Antilles (Map 5B).

*Specimens Examined.* MEXICO San Rafael [?], 1♂ (N. Banks, MCZ). San Luis Potosí: 6.4 km E bridge, Río Axtla, 5 Jan. 1952, 1♀ (W. S. Creighton, AMNH). Veracruz: Córdoba, 21 Sept. 1984, 1♂ (C. W. Melton, C. Agnew, AD); Fortín, 25 July 1956, 1♂ (V. Roth, W. J. Gertsch, AMNH). Oaxaca: Palomares, 12 Aug. 1963, 1♀ (D. Bixler, MCZ). Chiapas: La Zacuapala, Aug. 1909, 1♀ (A. Petrunkevitch, AMNH). GUATEMALA Quezaltenango, Dec. 1947, 1♀ (H. Wegener, AMNH). EL SALVADOR Santa Tecla, 5 Oct. 1949, 1♀ (J. Boursot, AMNH). HONDURAS Atlántida: Luncetilla, 18 July 1929, 1♀ (A. M. Chickering, MCZ). COSTA RICA Heredia: La Selva, nr. Puerto Viejo, 100 m, Mar. 1983, 1♀ (W. Eberhard SAE 23, TL 53-S, MCZ); 14 Jan. 1984, 1♀ (W. Eberhard 2319, MCZ).

CUBA Habana: Habana, NE San Antonio Baños

Figures 387–390. *Cyclosa vicente* n. sp., female. 387, 388, epigynum. 387, ventral. 388, posterior. 389, dorsal. 390, abdomen, lateral.

Figures 391–412. *C. diversa* (O. P.-Cambridge). 391–405, female. 391–400, epigynum. 391, 393, 395, 397, 399, ventral. 392, 394, 396, 398, 400, posterior. 391, 392, (Oaxaca, Mexico). 393, 394, (Honduras). 395, 396, (Costa Rica). 397, 398, (Depto. Valle, Colombia). 399, 400, (Manaus, Brazil). 401–403, dorsal. 401, (Chiapas, Mexico). 402, (Honduras). 403, (Rio Grande do Sul, Brazil). 404, abdomen, lateral. 405, abdomen, ventral (Rio Grande do Sul, Brazil). 406–412, male. 406, dorsal. 407–412,



left palpi. 407, 409, 411, apical. 408, 410, 412, mesal. 407, 408, (Veracruz, Mexico). 409, 410, (Cuba). 411, 412, (Manaus, Brazil).

Scale lines: 1.0 mm; genitalia 0.1 mm.



nr. Nico, July 1975, 1 ♀ (G. Alayon, MCZ). TRINIDAD Simla, 6.4 km N Arima, 10 May 1951, 1 ♀ (R. West, MCZ).

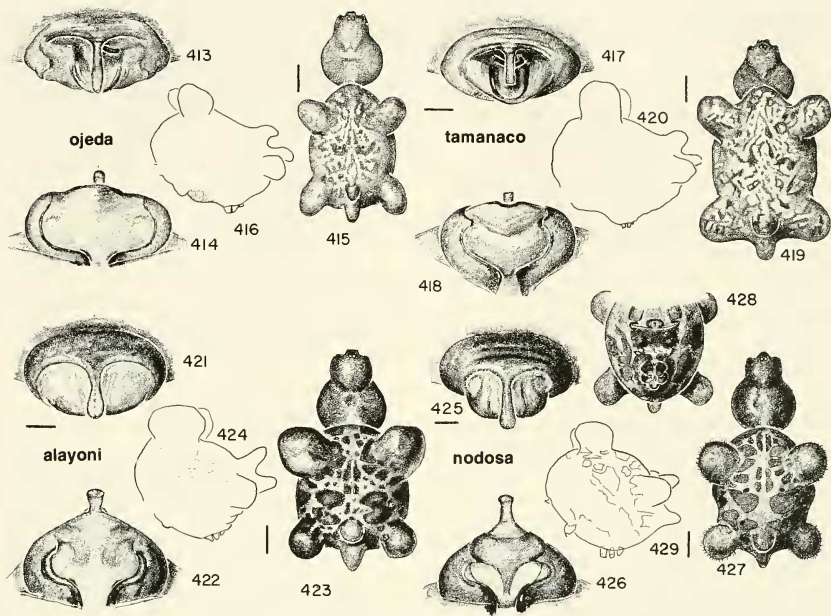
VENEZUELA *Monagas*: Caripito, 1 July 1942, 1 ♀ (W. Beebe et al., AMNH). *Mérida*: road to Mérida nr. La Azulita, 10 Dec. 1977, 1 ♀ (Y. Lubin, MCZ). COLOMBIA *Magdalena*: Gaira, 10 m, Dec. 1975 (W. Eberhard, MCZ). *Cundinamarca*: Silvania, 1,500 m, 11 Oct. 1957, 1 ♀ (C. Valderrama, MCZ). *Meta*: Carimagua, Oct 1973, 1 ♀ (W. Eberhard, MCZ); 5 km W Villavicencio, 920 m, 2 Mar. 1955, 1 ♀ (E. I. Schlinger, E. S. Ross, CAS); Lomalinda nr. Puerto Lleras, 03°18'N, 73°22'W, 300 m, Aug. 1998, 1 ♀ (B. T. Carroll, V. B. Roth, CAS). *Valle*: Atuncela, 800 m, 15 Dec. 1969, 1 ♀ (W. Eberhard, MCZ); Centro Exper. de Hoelchst Colombiana, Cali, Oct. 1973, 1 ♀ (W. Eberhard 639, MCZ); 1975, 1 ♀ (W. Eberhard 1141, MCZ); Lago Calima, 1,400 m, Jan. 1979, 1 ♂ (W. Eberhard 1822, MCZ); Río Jamundi, 1,000 m, 1972, 1 ♀ (W. Eberhard 524, MCZ); nr. Quereamal, 1,600 m, Aug. 1977, 2 ♀ (W. Eberhard, MCZ); Santander, 1,000 m, 13 Mar. 1970, 1 ♀ (W. Eberhard, MCZ). *Cauca*: betw. Prendamo and Mondomó, 1 ♀ (W. Eberhard, MCZ). *Vaupés*: Abijya, 00°62'N, 69°59'W, 19 Mar. 1958, 1 ♂ (B. T. Carroll, CAS). *Nariño*: Reserva Natural la Planada, Ricaunte, 01°09'N, 77°58'W, 2 ♀ (C. Valderrama, CV); Chachaquí, nr. airport, 19 Aug. 1973, 1 ♀ (N. List, SMNK). ECUADOR *Sucumbios*: Cuyabeno, Tarapoa, 23 June–1 July 1958, 1 ♀ (W. Maddison, MCZ); Río Tarapoa, 28 Apr. 1984, 1 ♀ (L. Avilés, MECN). *Cotopaxi*: Río Palenque, Nov. 1977, 1 ♂ (T. deVries, MECN). *Pastaza*: Puyo, 18 Apr. 1958, 1 ♂ (R. W. Hodges, MCZ). PERU *Loreto*: Río Samiria, 10 May–24 June 1990, 6 ♀ (T. Erwin, D. Silva, MUSM). *Huánuco*: Ayacu, 1 June 1967, 1 ♀ (A. F. Archer, AMNH); Tingo María, 2 June 1967, 1 ♀ (A. F. Archer, S. Risco, AMNH); Monson Valley, Tingo María, 19 Oct. 1954, 2 ♀; 10 Nov. 1954, 1 ♀; 2 Dec. 1954, 1 ♀ (E. I. Schlinger, E. S. Ross, CAS); Boqueron del Padre Ahad, 28 Dec. 1986, 1 ♀ (D. Silva, MUSM). *Juán*: Estancia Naranjal, San Ramón, 20–27 July 1965, 1 ♀ (P. Wygodzinsky et al., AMNH). *Madre de Dios*: Zona Reservada, Parque Nacional Mann, Pakitza, 10–19 Oct. 1991, 2 ♀, 1 ♂ (D. Silva, USNM); Zona Reservada Tambopata, 2–10 May 1984, 1 ♀ (T. L. Erwin, USNM); 6–14 Sept. 1984, 1 ♀; 23 July 1987, 1 ♀ (D. Silva, MUSM); 15 km Puerto Maldonado, 28 July 1989, 2 ♀ (D. Silva, MUSM). *Cuzco*: Quinceañil, 13 Aug. 1947, 1 ♀ (J. C. Pallister, CAS). *Arequipa*: Pooquerón, 470 m, Aug. 1946, 1 ♀ (F. Woytowski, AMNH). BRAZIL *Pará*: Belém, Fazenda Velha, Aug. 1970, 1 ♀ (M. Galiano, MACN). *Amazonas*: Reserva Km 41, 80 km N Manaus, 17 Apr. 1991, 1 ♀ (H. Fowler, E. Venticinque, R. S. Vieira, MCZ); Reserva Duque, Manaus, 1 ♂ (A. A. Lise, MCP 2026); 15–23 Aug. 1991, 1 ♀ (A. Brescovit, MCN 21409); 6–9 Aug. 1992, 1 ♀ (A. D. Brescovit, MCN 22311). *Minas Gerais*: Lavras, 1 Mar. 1979, 1 ♂ (W. D. Frank, MCZ). *Espírito Santo*: Rio

São José, 26 Sept. 1942, 1 ♀ (B. Soares, MZSP 13159); Santa Leopoldina, 28 Aug. 1942, 4 ♀ (B. Soares, MZSP 8428). *Rio de Janeiro*: Rio de Janeiro, 1 ♀ (MNRJ 366); 1 ♀ (Thayer Exped., MCZ); Pinheira, Rio de Janeiro, 2 ♀ (MNRJ 369); Jardim Botânico, 19 Sept. 1990, 1 ♀ (H. Hofer, INPA). *São Paulo*: Barueri, 26 June 1966, 1 ♂ (K. Lenko, MZSP 5912); Capital, 15 July 1941, 1 ♂ (J. Damigo, MZSP 13151); Guarulhos, 14, 15 June 1942, 7 ♀ (P. Pereira, MZSP 5206, 8427); June 1947, 6 ♀ (P. Pereira, MZSP 4615); 5 July 1942, 1 ♀ (P. Pereira, MZSP 7281); Instituto Botânico, 18 Aug. 1967, 1 ♀ (P. Biasi, MZSP 6545); Ipiranga Cap. 12 June 1948, 2 ♀ (F. Lane, MZSP 7327, 7355); Registro Microbacia, R. Quilombo, 16 Apr. 1990, 1 ♂ (P. Gnaspiñi, MZSP 11857); Ribeirão Pires, Cid. São Paulo, 700–800 m, Dec. 1945, 1 ♀ (H. Sick, AMNH). *Paraná*: Refúgio Biológico de Santa Helena, Santa Helena, 12–16 Nov. 1991, 1 ♂ (A. B. Bonaldo, MCN 21828). *Santa Catarina*: Morro do Baúllhota, 13 May 1996, 1 ♀ (C. N. Duckett, MCN 27561); Rio Vermelho, Mar. 1951, 1 ♀ (R. von Diringshofen, MZSP 13219). *Rio Grande do Sul*: Alto Casemiro, Cachoeira do Sul, 26 Sept. 1992, 1 ♂ (R. G. Buss, MCP 3468); Encantado, 21 Sept. 1985, 1 ♂ (A. D. Brescovit, MCN 14497); Itaíba, Arroio do Tigre, 15 Apr. 1978, 1 ♀ (A. A. Lise, MCN 7955); Novo Hamburgo, Morro dos Bois, Lomba Grande, 27 Nov. 1980, 1 ♂ (A. A. Lise, MCN 9416); Porto Alegre Morro do Côco, 25 Apr. 1975, 1 ♂ (A. A. Lise, MCN 10515); Santa Maria, 2 Nov. 1985, 1 ♂ (A. D. Brescovit, MCN 14599); 1 ♀ (T. White, MCZ); São Leopoldo, 20 Sept. 1965, 1 ♀ (S. Valle, MZSP 5494); Viamão, 19 Aug. 1994, 1 ♀ (A. Braul, MCP 7712). BOLIVIA *La Paz*: Apolo, 1,400 m, 5–15 Aug. 1989, 1 ♀ (L. E. Peña, AMNH); Inquisivi, 2,300 m, 5, 6 Dec. 1984, 1 ♀ (L. Peña, AMNH). PARAGUAY Asunción, Bolivia [probably an error of local.], 3 ♀ (MNHN 6519). *Alto Paraná*: Itala Reserve, 19 June 1984, 1 ♂ (L. Baert, J. P. Maelfait, IRSNB). *San Pedro*: San Estanislao, Sept. 1946, 2 ♀ (W. Hanke, MACN 1778, 1791). ARGENTINA *Misiones*: Eldorado, Sept.–Nov. 1964, 1 ♂ (A. Kovacs, AMNH); Santa María, Oct. 1944, 1 ♀ (M. J. Viana, MACN 1544); Puerto 17 de Octubre [Puerto Libertad], Oct. 1953, 1 ♂ (R. D. Schiapelli et al., MACN 3905); 4 ♀ (De Carlo et al., MACN 3857). *Salta*: Santa María, July 1957, 1 ♀ (A. G. Gaiá, MACN 2241). *Santa Fé*: Las Gamas, 20 km W Vera, 27–30 Oct. 1994, 2 ♀ (M. Ramirez, J. Faibovich, MACN). *Entre Ríos*: Gnaleguay, 26 Mar. 1943, 1 ♀ (H. Rossi, MACN, 1560). *Río Negro*: El Bolsón area, 1965, 1966, 1 ♀ (A. Kovacs, AMNH).

### *Cyclosa ojeda* new species Figures 413–416; Map 6F

*Holotype*. Female holotype from Curaçao, Netherlands Antilles, no date, and an exclamation mark, in the MNHN no. 4303. The specific name is a noun in apposition after Alfonso de Ojeda, the discoverer of the island.





Figures 413–416. *Cyclosa ojeda* n. sp., female. 413, 414, epigynum. 413, ventral. 414, posterior. 415, dorsal. 416, abdomen, lateral.

Figures 417–420. *C. tamanaco* n. sp., female. 417, 418, epigynum. 417, ventral. 418, posterior. 419, dorsal. 420, abdomen, lateral.

Figures 421–424. *C. alayoni* n. sp., female. 421, 422, epigynum. 421, ventral. 422, posterior. 423, dorsal. 424, abdomen, lateral.

Figures 425–429. *Cyclosa nodosa* (O. P.-Cambridge), female. 425, 426, epigynum. 425, ventral. 426, posterior. 427, dorsal. 428, abdomen, ventral. 429, abdomen, lateral.

Scale lines: 1.0 mm; genitalia 0.1 mm.

**Note.** The exclamation mark on the original label indicates that the collector was E. Simon.

**Description.** Female holotype. Carapace dark brown, a yellowish patch on each side of cephalic region (Fig. 415). Venter of abdomen black with a distinct pair of white spots. Abdomen with six tubercles, four spherical and a cylindrical median pair (Figs. 415, 416). Total length 7.7 mm. Carapace 2.8 mm long, 2.2 wide in thoracic region, 1.2 wide behind posterior lateral eyes. First femur 2.1 mm, patella and tibia

2.5, metatarsus 1.3, tarsus 1.1. Second patella and tibia 2.2 mm, third 1.0, fourth 2.2. Femora shorter than corresponding patellae and tibiae. First and second tibiae curved.

**Diagnosis.** The abdomen is blackish brown with a distinct pattern of dark lines and dots (Fig. 415). *Cyclosa ojeda* is distinguished from *C. tamanaco*, which has a similar abdomen, by the wide posterior median plate of the epigynum (Fig. 414).

**Distribution.** Curaçao (Map 6F); no other specimens were found.

***Cyclosa tamanaco* new species**

Figures 417–420; Map 6F

*Holotype.* Female holotype from Trinidad, Lesser Antilles, 17 July 1899 (J. H. Hart), in USNM. The specific name is a noun in apposition after the Carib tribe who were the original inhabitants of the island.

*Description.* Female holotype. Carapace dark brown with indistinct net-shaped pattern (Fig. 419). Abdomen brown with lines and dots (Fig. 419), venter dark without white patches. Abdomen with six spherical tubercles (Fig. 419). Total length 7.8 mm. Carapace 2.9 mm long, 2.1 wide in thoracic region, 1.3 wide behind posterior lateral eyes. First femur 2.0 mm, patella and tibia 2.4, metatarsus 1.2, tarsus 0.7. Second patella and tibia 2.2 mm, third 1.4, fourth 2.3. Length of femora shorter than adjacent patellae and tibiae. First and second tibiae curved.

*Diagnosis.* *Cyclosa tamanaco* differs from *C. nodosa* by the streaked marking of the abdomen and is distinguished from *C. ojeda* by having the posterior median plate smaller, and the openings of the epigynum closer together (Fig. 418).

*Distribution.* Trinidad (Map 6F), no other specimens were collected.

***Cyclosa alayoni* new species**

Figures 421–424; Map 6F

*Cyclosa nodosa*.—Alayón, 1952: 4 [not *C. nodosa* (O. P.-Cambridge)].

*Holotype.* Female holotype from NE of San Antonio de los Baños, Habana, Cuba (G. Alayón), in MNHC. The species has been named after the collector, Cuban arachnologist, Giraldo Alayón.

*Description.* Female holotype. Carapace, chelicerae, labium, endites dark brown. Sternum dark brown with a white median line that spreads anteriorly. Abdomen brown with trapezoidal, oval or round dark patches that are slightly sclerotized (Fig. 423), venter dark without white patches. Abdomen with two pairs of spherical, dorsal tubercles and two median posterior cylindrical tubercles (Figs. 423, 424). Total length 8.8 mm. Carapace 3.5 mm long, 2.6 wide in thoracic region, 1.5

wide behind posterior lateral eyes. First femur 2.3 mm, patella and tibia 2.7, metatarsus 1.5, tarsus 0.7. Second patella and tibia 2.4 mm, third 1.5, fourth 2.4. Femora shorter than corresponding patellae and tibiae.

*Diagnosis.* This species differs from *C. nodosa* by the shape of the median plate of the epigynum (Figs. 421, 422).

*Natural History.* The web was vertical, 17.6 mm in diameter and 130 cm above the ground. It had 26 radii (G. Alayón, personal communication).

*Distribution.* Cuba (Map 6F); no other specimens were found.

***Cyclosa nodosa* (O. P.-Cambridge)**

Figures 425–429; Map 6F

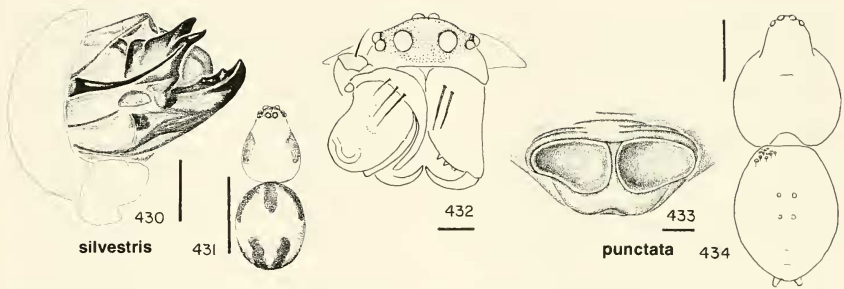
*Turckheimia nodosa* O. P.-Cambridge, 1889: 47, pl. 4, fig. 11, imm. Immature holotype from Chicoyito, Guatemala, from citron tree, in BMNH, examined.

*Cyclosa nodosa*.—F. P.-Cambridge, 1904: 496, pl. 47, fig. 11. ♀, Roewer, 1942: 760. Bonnet, 1956: 1320.

*Note.* Although immature, *Turckheimia nodosa* was considered a separate species by F. P.-Cambridge because the abdomen is square; that of *C. diversa* longer than wide.

The name Chicoyito is not in Selander and Vaurie (1962) but Chicoy is, located in the Alta Verapaz Province, Guatemala.

*Description.* Female from Costa Rica. Carapace dark brown with median light line on thorax (Fig. 427). Sternum dark brown with median white line. Abdomen white with dorsal, symmetrical, dark, lightly sclerotized patches (Fig. 427); venter black with indistinct, small transverse white marks in center (Fig. 428). Abdomen with a pair of spherical tubercles anterior and one posterior, the posterior median pointed, all hirsute (Figs. 427–429). Total length 9.5 mm. Carapace 3.7 mm long, 2.9 wide in thoracic region, 1.6 wide behind posterior lateral eyes. First femur 2.3 mm, patella and tibia 2.8, metatarsus 1.3, tarsus 0.4. Second patella and tibia 2.5 mm, third 1.7, fourth 2.7. All femora



Figures 430–432. *Metazygia silvestris* (Banks), male. 430, left palpus. 431, dorsal. 432, eye region, chelicerae and right palpus. Figures 433, 434. *Cyclosa punctata* Keyserling, female. 433, epigynum. 434, dorsal.

Scale lines: dorsal 1.0 mm; Figures 430, 432, and 433 0.1 mm.

shorter than corresponding patellae and tibiae.

**Variation.** Total length of females 8.6 to 9.5 mm. One specimen had light bands around the dorsal sclerotized patches. The illustrations were made from specimens from Escazú, Costa Rica.

**Diagnosis.** This species is distinguished from *C. ojeda* and *C. tamanaco* by the oval to circular markings of the abdomen (Figs. 427–429). It differs from *C. alayoni* by having the median plate of the epigynum narrower (Figs. 425, 426).

**Distribution.** Guatemala to Costa Rica (Map 6F).

**Specimens Examined.** COSTA RICA *San José*: San Antonio de Escazú, 1,500 m, July 1987, 1♀ (W. Eberhard TL 2–3, MCZ). *Cartago*: Road to Concepción de Tres Ríos, 1,300 m, Apr. 1979, 1♀ (W. Eberhard 1892, MCZ).

## APPENDIX

### *Metazygia silvestris* (Bryant) new combination Figures 430–432

*Larinia silvestris* Bryant, 1942: 5, figs. 5, 7, 10, 11, ♂. Male holotype from Maricao Forest, Puerto Rico, 2,500 ft [830 m], in MCZ, examined. Brignoli, 1983: 272.

**Description.** Male holotype. Carapace yellow-white with black band on each side of thorax; black band truncate at both

ends. Eye area black. Sternum with a yellow-black band around each side, fused posteriorly to form a black V. Legs yellow-white. Abdomen white with three anterior and posterior black bands (Fig. 431); venter yellowish white with a pair of indistinct black spots side by side. Posterior median eyes 0.8 diameter of anterior medians, laterals 0.7 diameter. Anterior median eyes 1 diameter apart, 0.5 diameter from laterals. Posterior median eyes 0.3 diameter apart, 1.1 diameters from laterals. Height of clypeus equals 0.6 diameter of anterior median eye. Abdomen oval (Fig. 431). Endite without tooth. Palpal patella with one macroseta. First coxa without hook. Total length 2.0 mm. Carapace 1.0 mm long, 0.8 wide in thoracic region, 0.5 wide behind posterior lateral eyes. First femur 1.1 mm, patella and tibia 1.5 (metatarsus and tarsus lost). Second patella and tibia 1.4 mm, third 0.8, fourth 0.9.

**Diagnosis.** The proximity of the posterior median eyes (Fig. 431), the oval abdomen (Fig. 431), and the single macroseta of the palpal patella (Fig. 432) places the species in *Metazygia*. The shape of the median apophysis, conductor and terminal apophysis (Fig. 430) separates this male from species of *Cyclosa* and other *Metazygia* species. There are macrosetae on the edge of the cymbium (Fig. 432) and a pair

of macrosetae on the anterior margin of each chelicera (Fig. 432). These macrosetae are not found in males of other *Mecyzygia* species.

*Cyclosa punctata* Keyserling

Figures 433, 434

*Cyclosa punctata* Keyserling, 1880: 312, pl. 2, fig. 14. ♀. Female holotype, from Neu Freiburg, Brazil [Nova Friburgo, Est. Rio de Janeiro], in BMN11, examined. Keyserling, 1893: 271, pl. 14, fig. 201, ♀. Roewer, 1942: 760. Bonnet, 1956: 1322.

**Description.** Female holotype. Carapace, legs golden yellow. Abdomen white with tiny setae, each with a sclerotized reddish base (Fig. 434); venter with black and white patches. Posterior median eyes same diameter as anterior medians; anterior laterals 0.7 diameter of anterior medians, posterior laterals 0.9 diameter. Anterior median eyes 0.8 diameter apart, 0.5 diameter from laterals. Posterior median eyes with narrow canoe-shaped tapetum. Posterior median eyes 0.7 diameter apart, 1 diameter from laterals. Lateral eyes touching each other. Ocular trapezoid almost square, longer than wide, slightly wider in front than behind. Height of clypeus equals 1 diameter of anterior median eye. Abdomen oval (Fig. 434). Total length 5.7 mm. Carapace 3.7 mm long, 2.9 wide in thoracic region, 1.2 wide behind posterior lateral eyes. First femur 3.0 mm, patella and tibia 3.4, metatarsus 2.5, tarsus 1.1. Second patella and tibia 3.5 mm, third 2.4, fourth 3.7.

**Diagnosis.** This species is distinguished by its narrow eye region (Fig. 434) and by the epigynum with two depressions, T-shaped septum and posterior border (Fig. 433). It resembles *Gea* species, but lacks the procurved posterior median eye row. Placement of this species is uncertain. It may not be an araneid or tetragnathid.

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